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FEDERAL-STATE RELATIONSHIPS IN THE ATOMIC ENERGY FIELD

HEARINGS

BEFORE THE

JOINT COMMITTEE ON ATOMIC ENERGY

CONGRESS OF THE UNITED STATES

EIGHTY-SIXTH CONGRESS

FIRST SESSION

ON

FEDERAL-STATE RELATIONSHIPS IN THE ATOMIC ENERGY FIELD

MAY 19, 20, 21, 22, AND AUGUST 26, 1959

Printed for the use of the Joint Committee on Atomic Energy

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FEDERAL-STATE RELATIONSHIPS IN THE ATOMIC ENERGY FIELD

TUESDAY, MAY 19, 1959

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D.C.

The committee met, pursuant to notice, at 10 a.m., in room P–63, the Capitol, Representative Cary T. Durham (vice chairman of the Joint Committee) presiding.

Present: Senator Anderson; Representatives Durham, Holifield, Aspinall, Bates, and Westland.

Also present: James T. Ramey, executive director; and David R. Toll, staff counsel, Joint Committee on Atomic Energy.

Representative DURHAM. The committee will come to order.

This morning the Joint Committee on Atomic Energy is commencing public hearings on Federal-State relationships in the atomic energy field.

Plans for these hearings have been underway for many months. Earlier this year the Joint Committee distributed to all interested persons a 520-page volume entitled "Selected Materials on Federal-State Cooperation in the Atomic Energy Field," as collected by the committee staff, pursuant to directions of the chairman and vice chairman, to assist persons to prepare for these hearings beginning today. An outline and list of witnesses for these hearings has also been prepared and is available.

In preparation for these hearings, a letter was sent to each State Governor signed by Chairman Anderson, Senator Hickenlooper, Congressman Van Zandt, Congressman Holifield, and myself, informing them of the three sets of hearings related to Federal-State relationships which the committee is conducting this year. We received replies from a number of Governors, and we are pleased to see that a number of States have sent representatives to participate in these hearings. Without objections, a copy of the letter to the Governors, dated February 11, 1959, will be inserted at this point.

(The letter referred to follows:)

February 11, 1959.

DEAR GOVERNOR: As members of the Joint Congressional Committee on Atomic Energy, we would like to inform you of the plans of our committee this year to consider certain questions in the atomic energy field of mutual interest both to Federal and State Governments. We plan to hold three sets of public hearings and consider certain legislative proposals which we thought might be of interest to you and the members of your State legislature:

First, from January 28 to February 3, 1959, the Special Subcommittee on Radiation of the Joint Committee (Congressman Chet Holifield, of California, chairman) has held public hearings on "Industrial Radioactive Waste Disposal."

In particular, on the final day of the hearings, Tuesday, February 3, representatives from both Federal and State agencies were requested to present statements concerning activities of their agencies in regulating radioactive waste materials.

Second, from March 10 through March 18, 1959, the Subcommittee on Research and Development (Congressman Melvin Price, of Illinois, chairman) has scheduled public hearings on "Employee Radiation Hazards and Workmen's Compensation Problems." Witnesses from both Federal and State agencies, as well as other organizations, will be invited to testify during these hearings.

Finally, public hearings have been scheduled (tentatively from May 12 through May 15, 1959) on "Federal-State Relationships in the Promotion and Regulation of Atomic Energy Uses." These hearings will consider legislative proposals to amend the Atomic Energy Act of 1954 with respect to Federal-State cooperation. In preparation for this final set of hearings, the committee has directed the committee staff to assemble certain materials and background information pertaining to Federal and State activities in the atomic energy field, and these will be published in the form of a Joint Committee print in the near future. We will plan to send you two copies, or more copies if you should so desire, of this Joint Committee print as soon as it is published, about February 25, 1959.

Attached for your information is a list providing more specific dates and background information on these hearings. If you desire to send a representative to attend or participate in any of these hearings, the Joint Committee would be glad to hear from you.

We are sending you this information at this time in order that you may be aware of our plans to consider legislative proposals on the Federal level, and in order that we may work together to obtain harmonious Federal-State legislation in the atomic energy field. If you, or any member of your State legislature, should desire any further information concerning the plans of the Joint Committee, please let us know, or contact the committee staff (Mr. James T. Ramey, executive director), and we will be glad to provide more detailed information concerning the scope of these hearings.

Sincerely yours,

CLINTON P. ANDERSON,
Chairman.

CARL T. DURHAM,
Vice Chairman.

BOURKE B. HICKENLOOPER,
Member.

JAMES E. VAN ZANDT,
Member.

CHET HOLIFIELD,
Chairman, Subcommittee on Legislation.

During the first 2 days of the hearings, the committee hopes to obtain background information, and summaries of activities of Federal, State, and local governments in the atomic energy field, on an informational basis. On Thursday and Friday of this week, we are then scheduled to hear from witnesses concerning the AEC proopsed bill and other recommendations, proposals and opinions.

Our first witness this morning is Dr. G. Hoyt Whipple of the University of Michigan School of Public Health, to give us a brief review of the nature of the radiation and need for regulations. Dr. Whipple will be followed by Dr. Lauriston Taylor on "Radiation Standards as a Basis for Regulation." Witnesses from AEC and the Public Health Service will then present background information on the activities of the Federal Government, primarily in controlling radiation hazards.

I would like to insert in the record at this point the outline and list of witnesses dated May 18, 1959.

(The document referred to is as follows:)

CONGRESS OF THE UNITED STATES

JOINT COMMITTEE ON ATOMIC ENERGY

PUBLIC HEARINGS ON FEDERAL-STATE RELATIONSHIPS

May 19–22, 1959

OUTLINE AND LIST OF WITNESSES

May 18, 1959

NOTES.—The first 2 days, May 19 and 20, are scheduled for witnesses to present background information, and summaries of activities of Federal, State, and local governments, on an informational basis. The next 2 days, May 21 and 22, are scheduled for witnesses to present proposals, recommendations and opinions The hearings will be continued on Monday and Tuesday of the following week, May 25 and 26, if necessary. All hearings will be in room P–63 of the Capitol (the old Supreme Court room) except the hearings for Friday, May 22, and Monday, May 25 (if held), will be in room F–39 of the Capitol).

First day, Tuesday, May 19, 1959, room P–63, Capitol

I. "Review of the Nature of Radiation and Need for Regulations," G. Hoyt Whipple, Jr., University of Michigan School of Public Health; (one-half hour, 10 to 10:30 a. m.):

(*a*) "Types of Ionizing Radiation."
(*b*) "Sources of Radiation."
(*c*) "Effects of Radiation Upon Man."

II. "Radiation Standards as a Basis for Regulation," Dr. Lauriston Taylor, chairman, National Committee on Radiation Protection (NCRP), (one-half hour, 10:30 to 11 a.m.):

(*a*) "NCRP Relation to ICRP."
(*b*) "'Permissible Dose' Concept."
(*c*) "NCRP Subcommittee on State Regulations."

III. Activities of Federal Government:

A. Atomic Energy Commission (2 hours, 11 to 12 a.m., 2 to 3 p.m.):

1. Commissioner John S. Graham, introduction.
2. Dr. Charles H. Dunham, "Contract Operations and Standards."
3. Dr. Joseph Lieberman, "Waste Disposal."
4. Oscar S. Smith, "Training of Personnel."
5. Curtis A. Nelson, "Inspection."
6. Harold Price, "Licensing Activities."
7. Dr. Clifford Beck, "Reactor Hazards."

B. U.S. Public Health Service, Dr. David Price and Dr. Francis J. Weber (1 hour, 3 to 4 p.m.):

1. "Responsibility for X-rays, Radium, Machines, Other Radiation Sources."
2. "Recent Report of Advisory Committee on Radiation."
3. "Inspection and Enforcement."
4. "Relationships with States."

C. Statements for the record may be received from other Federal agencies, including Interstate Commerce Commission, Department of Defense, Department of Labor, Bureau of Mines, Department of Agriculture, Civil Aeronautics Administration, Maritime Administration, and Food and Drug Administration.

(Previous statement obtained from Federal agencies on their activities in regulating radiation hazards are reprinted at ch. 3, pp. 35–150, of Joint Committee print entitled "Selected Materials on Federal-State Cooperation in the Atomic Energy Field," March 1959.)

Second day—Wednesday, May 20, 1959, room P–63, Capitol

IV. Activities of State and local governments:

A. "Activities of Joint Federal-State Action Committee in Atomic Energy Field," Gov. Robert E. Smylie of Idaho (one-half hour, 10 to 10:30 a.m.).

B. Summary of State Statutes and Regulations: Lee Hydeman, University of Michigan Law School atomic energy research project (1 hour, 10:30 to 11:30 a.m.).

C. Round table report on activities of States: (1 hour, 2 to 3 p.m.):

1. Texas—Dr. W. L. Wilson, "Activities of a State Health Department."

2. New York—Dr. Morris Kleinfeld, "Activities of a State Labor Department."

3. Colorado—Mr. P. W. Jacoe, "Activities of a State Health Department With Respect to Uranium Mining and Processing."

D. Local and municipal activities: Mr. Harold Sandbank, American Municipal Association (one-half hour, 3 to 3:30 p.m.).

Third day—Thursday, May 21, 1959, room P–63, Capitol

V. Proposals and recommendations: Witnesses may make recommendations for Federal legislation and other measures as to (1) responsibilities of States and relationships to Federal Government; (2) responsibilities of Federal Government and allocation of responsibilities within Federal Government; and (3) possible needs for increased training and assistance from Federal and State Governments.

A. AEC—Commissioner John S. Graham and AEC staff (1 hour 10 to 11 a.m.):

1. "Description of Bill Proposed by AEC."

2. "Other Recommendations and Proposals."

B. U.S. Public Health Service: Proposals and Recommendations (1 hour, 11 to 12 a.m.).

C. Recommendations by representatives of State governments (2 hours, 2 to 4 p.m.):

1. Jo M. Ferguson, attorney general, Kentucky, representing Association of Attorneys General.

2. Charles F. Schwan, representing Council of State Governments.

3. Frank Norton, Texas, representing Southern Governors' Conference.

4. Representatives of Governors of some States will be present, and may desire to make statements, including the following:

(*a*) Massachusetts, Raymond I. Rigney.

(*b*) West Virginia, Clement R. Bassett.

(*c*) Florida, Karl R. Allen and George Kinsman.

Fourth day—Friday, May 22, 1959, room F–89, Capitol

D. Recommendations of other interested groups:

1. Leonard English, representing Firefighters Union (one-half hour, 10 to 10:30 a.m.).

2. Andrew Biemiller, representing AFL–CIO (one-half hour, 10:30 to 11 a.m.).

3. William McAdams, representing U.S. Chamber of Commerce (one-half hour, 11 to 11:30 a.m.).

4. William Berman and Lee Hydeman, University of Michigan Law School atomic energy research project (one half hour, 11:30 to 12 a.m.).

5. Otto Christenson, representing Conference of State Manufacturers Association (one-half hour 2 to 2:30 p.m.).

6. Prof. George Frampton, University of Illinois Law School (one hour, 2:30 to 3 p.m.).

7. Representative of State and Territorial Health Offices (one-half hour, 3 to 3:30 p.m.).

Representative DURHAM. Dr. Whipple, we are very glad to have you with us this morning. We appreciate your coming down here for these hearings. I know you are busy, like the rest of us.

Do you have a written statement?

STATEMENT OF G. HOYT WHIPPLE, ASSOCIATE PROFESSOR OF RADIOLOGICAL HEALTH, SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF MICHIGAN

Dr. WHIPPLE. I have a written statement, which I would like to read, Mr. Chairman.

Representative DURHAM. You may proceed to read your statement.

Dr. WHIPPLE. In view of the exhaustive testimony on atomic energy matters that has been presented to this committee, the present statement can contain little that is not already completely understood by the members of the committee. Perhaps, however, this review may be of value in arranging concepts already familiar into a form that will facilitate the committee's deliberations on proper regulations in this complex field.

Four types of ionizing radiation are of principal concern in atomic energy: alpha particles, beta particles, quantum radiations, and neutrons.

Alpha particles are the nuclei of helium atoms. They carry an electrical charge of plus two. The mass of the alpha particle is approximately four, that is, an alpha particle weighs about four times as much as ordinary single weight hydrogen.

Alpha particles are produced by such natural radioactive isotopes as radium 226, and also by such manmade radioactive isotopes as plutonium 239. With few exceptions, the energies of the alpha particles emitted by radioactive isotopes are less than 10 million electron volts. High energy accelerators like cyclotrons can produce alpha particles of much higher energies, but this occurs only in rather rare situations.

By virtue of their relatively large electrical charge and their low velocities, which result from their large mass, alpha particles are capable of penetrating only short distances in common materials. The range of alpha particles in air is typically 1 or 2 inches, and only a few thousandths of an inch in living tissue. Because their ranges are short, alpha particles deposit relatively large amounts of energy in a small space.

Beta particles are high speed electrons, either negative or positive. Both types have a mass about one eighteen-hundredths that of ordinary single weight hydrogen. The common type is the negative beta particle carrying an electric charge of minus one. When a negative beta particle comes to rest it is indistinguishable from an ordinary atomic electron. The rare positive beta particle, or positron, carries an electrical charge of plus one. When a positive beta particle comes to rest it coalesces with an ordinary negative electron; the electrical charges neutralize one another; and the masses of both are converted into energy in the form of two quanta of gamma radiation, each with an energy of about one-half of a million electron volts.

Negative beta particles are produced by such natural radioactive isotopes as potassium 40, and also by such manmade radioactive isotopes as strontium 90. Positive beta particles are produced by a few manmade radioactive isotopes, of which copper 64 is an example. With few exceptions, the beta particles, both positive and negative, emitted by radioactive isotopes have energies less than 10 million electron volts. High-energy accelerators, like betatrons, can produce external beams of negative beta particles with energies up to several hundred million electron volts.

Beta particles, by virtue of their small mass, travel at very high velocities, approaching the speed of light. For this reason, the ranges of beta particles are typically much greater than those of alpha particles. As an example, the maximum range of the 1.7-million-electron-volt beta particles from phosphorus 32 is about 20 feet in air and about a third of an inch in living tissue.

Quantum radiations are electromagnetic radiations similar to light and radio waves. They have no electrical charge and no mass. The two forms of ionizing quantum radiations are X-rays and gamma rays. X-rays are produced when electrons decelerate or shift energy levels in the electrical field of an atom. Gamma rays are produced inside the atomic nucleus as the result of nuclear rearrangements.

The most common way of producing X-rays is in the X-ray tube. Electrons are accelerated and directed against a heavy metal target. When the electrons strike the target, they give up some of their energy in the form of X-rays. The energy of the X-rays used in medical practice is usually of the order of 100,000 electron volts. High-energy accelerators, like the betatron, produce X-rays with energies up to hundreds of millions of electron volts.

Gamma rays are produced by such natural radioactive isotopes as radium B, by such manmade radioisotopes as cobalt 60, by neutron capture, and by nuclear fission. With few exceptions, these gamma rays have energies less than 10 million electron volts.

Unlike alpha and beta particles, X-rays and gamma rays do not have finite ranges, but are absorbed exponentially. This means that a given thickness, say, 1 inch, of a material absorbs one-half of the gamma radiation, another inch will absorb one-half of the remaining radiation, and so on. The thickness of concrete required to absorb one-half the X-radiation from an X-ray tube operated at 100,000 volts is about three-quarters of an inch, whereas about 3 inches of concrete is necessary to absorb one-half the gamma radiation from cobalt 60. Because of their relatively high penetrating power, X and gamma rays deposit their energy more uniformly through a human body than do alpha and beta particles.

Neutrons have no electrical charge and a mass of approximately 1. Neutrons exist in the nucleus, and, with protons, constitute the principal building blocks of atomic nuclei. They are produced by a variety of nuclear reactions and, of course, by nuclear fission, but only relatively rarely by radioactive decay.

Except for the very few neutrons generated by cosmic radiation and by spontaneous fission, neutrons do not occur naturally. The outstanding manmade source of neutrons is the nuclear reactor. Most of the high-energy accelerators (cyclotrons, synchrotrons, betatrons, et cetera) are capable of producing significant quantities of neutrons when suitable targets are used. Capsule neutron sources are made by mixing an alpha-emitting radioactive isotope, such as polonium 210, with a suitable material, such as beryllium. Few of the neutrons produced by reactors or capsule sources have energies in excess of 10 million electron volts. The bigger accelerators produce neutrons with energies of hundreds of millions of electron volts, or greater.

Neutrons, like gamma rays, are absorbed exponentially. The thickness of concrete required to absorb one-half of the neutrons from a nuclear reactor is about 3 inches. Because of their relatively high penetrating power neutrons deposit their energy fairly uniformly throughout the human body.

In outlining the characteristics of the four types of radiation, I have mentioned typical sources of each type. Such a physicist's catalog is not very helpful in deciding what type of regulations may be necessary to control human radiation exposure. It seems to me

that it will be more helpful to discuss radiation sources from the standpoint of the ways in which human beings may be exposed to them. The possible sources of radiation exposure may be arranged under three general headings: occupational, medical, and environmental.

Occupational radiation exposure is that received by a person while he is working in a radiation industry. A radiation worker accepts occupational radiation exposure as an intrinsic part of his work. He knows of the possibility that he will be exposed to radiation; he expects to be instructed in the hazards associated with his work; and he has a right to know what his actual exposure has been. The acceptance of such work is an individual decision that can be reversed at any time.

Occupations involving the possibility of radiation exposure include the following:

1. Manufacture of devices incorporating radioactive materials, such as self-luminous articles, the production of radiation-producing devices, such as X-ray machines, and the inspection of products with radiation-producing devices, such as the beta thickness gage.
2. Operation of nuclear reactors for production, power, testing, and research.
3. Processing of spent fuel from nuclear reactors to separate unused uranium and newly produced plutonium from fission products.
4. Disposal of radioactive waste materials by sea burial, incineration, tank storage, and ground burial.
5. Transportation of highly radioactive materials, such as spent fuel elements, wastes, and prepared sources, by truck, ship, rail, and possibly airplane.
6. Inspection and testing by means of radiation; for example, the radiographing of metallic welds with X or gamma rays.
7. Military applications of atomic energy, including weapons.
8. Medical applications involving X-rays or radioactive isotopes for a part of some course of therapy, such as the X-ray treatment for the diagnosis and treatment of disease. The occupational exposures here are those to the doctors, nurses, and technicians. The exposure received by the patient is not to be classed as occupational.
9. Research employing radiations and radioactive materials in all the multifarious applications to which they are put in every branch of science.

Medical radiation exposure is that received by a patient incidental to some diagnostic procedure, such as the chest X-ray, or that which is a part of some course of therapy, such as the X-ray treatment for cancer. All medical exposures are accepted knowingly by the patient. They are carried out for a purpose that is considered advantageous for the patient in the judgment of the attending physician. It is worth noting that exposures of this kind have always been explicitly exempted from radiation regulations.

Environmental radiation exposure, as the term is used here, means all exposures, other than occupational and medical, that a person may receive. Of particular significance in the present connection is the fact that environmental radiation exposure is received unknowingly and unwillingly.

Among the sources of environmental radiation exposure are the following:

1. Natural background radiation from cosmic rays and from radioactive materials in the ground, the air, and in the human body itself.
2. Radioactive fallout from nuclear test detonations.
3. Accidents involving the release of radiation and radioactive materials from any of the occupational sources mentioned earlier.
4. Radioactive materials in the gaseous and liquid effluents from operations employing these materials. Examples are reactor off-gases, sanitary wastes from radioistope clinics, and laboratory liquid wastes.
5. Improper storage or disposal of the vast quantities of radioactive fission products, solid, liquid, and gaseous, extracted from spent reactor fuel. These wastes are the largest foreseeable source of environmental radiation exposure. The proper management and disposal of these wastes represent the outstanding public health problem of the nuclear power industry.
6. The last source of environmental radiation exposure, and I use the word "last" advisedly, is nuclear warfare.

The fact that single, large doses of radiation can injure and kill human beings has, unforunately, been thoroughly documented. However, the effects on human beings of small repeated doses of radiation are not known exactly. The smaller the dose, the less exactly can the effects of chronic radiation exposure be predicted.

The uncertainties concerning the effects of chronic radiation exposure do not result from lack of study. This committee is well aware of the large sums of money and the careful scientific skills that have been devoted to this problem. The difficulty is inherent in the problem itself, which is concerned with the least observable injury that may develop in a man's lifetime, or in that of his descendants.

The avalable human data have been and continue to be examined meticuously for effects that may be regarded as statisically significant. So far, the results of chronic human exposure to radiation have been rather inconclusive. Most of what we know is derived from animal experiment, and is therefore subject to the uncertainty of extrapolation from animal to man.

As the result of extensive experiments with animals it is believed that chronic radiation exposure, in sufficiently large amounts, will produce the following three effects:

1. Increased rate of aging with a resulting reduction in life expectancy.
2. Increased incidence of neoplastic diseases, such as lukemia.
3. Increased incidence of genetic mutations.

This committee has heard each of these effects discussed by highly competent investigators. There are, however, a few points I should like to emphasize.

The first point to be noted is that none of these effects is unique to radiation. Chronic radiation exposure merely increases the rate at which some conditions normally occur, and therefore the effects of this exposure can be observed only by statistical analysis of data from large numbers of individuals. This means that in many cases it will be impossible to determine whether the condition of a particular individual was produced by chronic radiation exposure, or whether the disease arose from purely natural causes. There are some exceptions like the cases of the radium dial painters, but in general it will be difficult to establish a cause and effect relationship in cases of chronic radiation injury.

The second point I wish to emphasize concerns the levels of chronic radiation exposure permitted by regulations. By definition, the maximum exposures permitted by regulations will be so low that no significant injury will result. In order to estimate these maximum permissible exposures, data from animal experiments must be extrapolated, first from animal to man, and second, from dose levels where measurable effects are produced to levels where no effects are expected. The later extrapolation is carried out on the assumption that there is no threshold for radiation injury. Quite properly, this is the most conservative interpretation that can be put on the available data. It is well to remember, however, that there may be a substantial safety factor buried in this assumption.

The last point I wish to make concerns scientific humility. Whenever anyone speaks of chronic radiation injury, he places great stress, as I have done, on the inadequacy of the available data. Humility is a proper scientific attitude, but at times it may leave the wrong impression. Compare our knowledge of the effects of chronic radiation exposure to our knowledge of the effects of chronic exposure to some older, more familiar substances and radiations. Take, for example, carbon monoxide, ultraviolet light, or cigarette smoke: we do not know whether chronic exposure to small amounts increases the rate of aging, increases the incidence of neoplastic diseases, or increases the rate of genetic mutations. It has been said, and I believe correctly, that we know relatively more about the effects of chronic radiation exposure than we do about almost any other factor in our technical civilization.

This completes my statement. I hope it may prove helpful in the difficult decisions this committee is called upon to make.

Thank you.

Representative DURHAM. Doctor, your statement has been very helpful. At the present time, of course, a lot of information has to be developed, before you can arrive at procedures in safety, which I think you point out in your statement. That is why we are continuing to hold hearings as we have recently and again today. We are trying to learn as much as we can, through the experiments being carried out by you people and others.

I want to ask you a question or two, Doctor. What would be the hazards to the public if no efforts were made to control radiation exposures, in view of the increasing peaceful uses of atomic energy? What is your opinion on that?

Dr. WHIPPLE. There are certainly many, many hazards, and it is very difficult to characterize in a general way what the situation might be if there were no regulations or no concepts of limiting exposures. The picture that comes first to my mind is that it might resemble the situation on the highways if there were no speed limits, no traffic regulations of any kind. I think the result would be an extremely dangerous and devastating chaos.

Representative DURHAM. I think I agree with you on that.

Which of these present the greatest hazards to the public, in your opinion, Doctor, medical and dental X-rays, radioactive isotopes, waste disposal, or other power reactors, which we are building fast now in this country?

I think you mentioned that on page 8 of your statement here, as I recall, about the exposures and such things.

Dr. WHIPPLE. I believe that today the sum total of the greatest exposure to people in the United States comes from the medical uses of X-ray. Dr. Taylor I know has some figures on this which he can give you if you want numbers. But I think in this connection it is important to separate exposure from hazard. The point I attempted to emphasize in my statement is that medical exposure is given, in the judgment of a physician, balancing possible harmful effects against the good he expects to be able to do from the information he provides or the treatment he is delivering. So even though it is so that more man-roentgens of exposure in the United States result from medical practice, I do not like to see this bracketed under "hazards of radiation."

Representative DURHAM. I notice in your statement you ask for exemption of the medical profession.

Dr. WHIPPLE. I think this must be; yes, sir.

Representative DURHAM. You hoped that that would not be brought under control through these regulations. And I think I agree with you if it can be controlled and safely controlled. But I have been concerned, and perhaps you have, about the technological knowledge of some of these people using these instruments throughout the country. I have had pretty much exposure myself.

Dr. WHIPPLE. As an educator, I can be expected to agree with you that the use of medical radiation will be improved by education of the people who use it, and there is certainly an active interest today on the part of the profession in reducing this exposure to the lowest possible level.

Representative DURHAM. I think you are correct in that, because a few years ago anybody who wanted to buy an X-ray machine went out and bought one without very much knowledge about it, and it was applied to the body, and then they decided what to do about the tooth or whatever. I think we are much more clear on the matter today. I notice that in the hospitals.

Dr. WHIPPLE. There is a second part to your question I would like to answer, if I may.

Representative DURHAM. Proceed.

Dr. WHIPPLE. As far as potential hazard is concerned, admitting that perhaps today the medical exposure is the greatest one, but looking to the future, as to the greatest possibility for exposure of the entire population, it seems to me this possibility resides in improper waste disposal, disposal of the radioactive wastes from a nuclear power industry. And certainly from the public health point of view, this is the outstanding problem.

Representative DURHAM. I think I agree with you. I think Dr. Lieberman is going to speak on that point in his statement this morning. It is quite a problem. We have already realized that.

Dr. WHIPPLE. I know that you have.

Representative DURHAM. In fact, we have had long hearings on it, also.

Mr. Bates, any questions?

Representative BATES. I think you have touched on the question that I had in mind.

On page 6, you said: "It is worth noting that exposures of this kind," referring to medical radiation, "have always been specifically exempted from radiation regulations."

Is that just a comment that you are making, or do you have a recommendation with respect to that, as well?

Dr. WHIPPLE. As it stands, it is a statement of fact, but it seems to me that it recognizes a fundamental truth, that future regulations must also recognize, and that is that it is inconceivable, to me at least, that one should attempt by regulations to limit what a physician in his judgment may give to a patient in the course of an examination or therapy. I cannot see that regulations have any place in this area.

Representative BATES. That is providing, of course, that the doctors are aware of the dangers inherent in radiation. I presume the judgment they must make is on the danger of losing a life from other purposes, or a hope of saving a life by exposing them to this particular danger. So there is a balance that they must strike.

But my question is: You say it is a truth. Is it also a danger? Do you feel that doctors generally are sufficiently advised of the inherent dangers of radiation, so that they can exercise proper judgment on this?

Dr. WHIPPLE. To the degree that they are not sufficiently informed, I cannot feel that the answer is regulation. The thing I would like to point out is that the question you have raised with regard to radiation in the hands of a physician is exactly that, that a physician has with almost everything he uses, drugs, any kind of therapy. He must in his judgment balance the possible risk to the patient against the possible gain to the patient. And in this, radiation is no different than many of the other things that the physician is called upon to administer to his patients.

Representative BATES. His judgment is only as good as his knowledge. My question is: Does he have sufficient knowledge in this particular field for passing judgment? I am speaking generally, now. Are you satisfied that throughout the country doctors who are using radiation of one kind or another have a sufficient knowledge of the subject so that they can pass adequate judgment on this matter?

Dr. WHIPPLE. I am sure that there are cases where many people in this room would say that in a given instance a physician was not sufficiently well informed.

Representative BATES. Then you say that we should not have regulations which would protect the public. Certainly we would not contend that the public should not be protected.

Dr. WHIPPLE. No, sir.

Representative BATES. In which form do you feel they should be advised of the inherent dangers? And if it is not by regulation, how will you get the word to them?

Dr. WHIPPLE. It seems to me the way this will be done, and it is a slow process, I know, is in the education that prepares a doctor for the practice of medicine. Just as he learns the things he must know in balancing gains and losses in the other elements; these he learns in his training. And I think radiation should be an integral part of the medical education. This, I think, is the way to meet this problem.

Representative BATES. You feel it should be handled in that way. Now my question is: Do you feel that it is properly handled in that way? This is not a new field?

Dr. WHIPPLE. No, it is not.

Representative BATES. Do you feel that the medical profession is pursuing this with the maximum amount of diligence in order to protect the public? That is what I am trying to find out.

Dr. WHIPPLE. I would certainly not say that it was perfect. I am not in a position to know in detail all of the medical programs. Dr. Dunham, who is on this morning, I am sure can give you a better answer to this question than I.

Representative BATES. Fine. Thank you.

Mr. RAMEY. It is possible to have voluntary codes established by groups like your NCRP and others, that set standards, that your medical people, for example, could follow, and by other educational means cut down on such amounts of exposure. As a matter of fact, I think that is going on. You see in the papers and so on criticisms of the amounts of exposure in individuals, and that the medical profession is getting much more aware of the need for cutting down on the excessive use of radiation.

Dr. WHIPPLE. Certainly the great value of regulations in this as in many other connections is their educational value in informing people of the standards and the problems.

Representative BATES. But you believe that is outside your jurisdiction, so you do not feel able to qualify yourself as a witness on that particular point?

Dr. WHIPPLE. You have many more competent witnesses in these areas than I in the room.

Mr. TOLL. Dr. Whipple, you pointed out various types of radiation. It might be well to indicate for the purposes of these hearings at this point that not all of these radiation sources are regulated by the same governmental bodies. AEC regulates only activities licensed by it, and does not regulate medical X-rays. AEC does not regulate natural radiation sources, such as radium, nor radiation from accelerators. These sources are left to regulation by State and local agencies.

Now, do you think this is a workable division, or should some sort of change in allocation of responsibilities be considered, in your opinion?

Dr. WHIPPLE. Speaking as a scientist, and not as a lawyer, as I must, I will say that this division, between the radiations and materials that fall within the responsibility of the Atomic Energy Commission and the other sources that fall outside of this, is a very unnatural one; and neither the human body nor many of our instruments can distinguish between an AEC-produced isotope and a cyclotron-produced isotope. And to this extent it is a puzzling and unsatisfactory division.

Representative DURHAM. It would be very difficult, I imagine, Doctor, to identify it, if you had to go to court, to prove a case, as to where it came from.

Dr. WHIPPLE. It would be extremely difficult.

Representative DURHAM. Again thank you very much, Doctor. You certainly gave us a fine paper, and we appreciate it very much.

Representative DURHAM. The next witness is Dr. Lauriston Taylor, chairman of the National Committee on Radiation Protection.

Mr. Taylor, we are always glad to have you back with us. It seems we have to call on you a lot now.

You may proceed with your statement. I see you have a prepared statement.

STATEMENT OF DR. LAURISTON S. TAYLOR, CHAIRMAN, NATIONAL COMMITTEE ON RADIATION PROTECTION

Mr. TAYLOR. Thank you.

Mr. Durham, it is a pleasure to be able to appear again before your committee in order to explain another phase of the work of the National Committee on Radiation Protection. This phase will have to do with its activity in the area of radiation protection regulations, such as might be used by State agencies or even by the Federal Government.

I would like to apologize, because I have not been able to give you more copies of this statement. Time has prevented it, over the last few days.

I will not go into any discussion about the background and the work of the AEC, since I believe this has been adequately covered in previous hearings this spring, and perhaps reference may be made to the material that has already been submitted in connection with these earlier hearings.

The material which I will discuss later is based on the recommendations of the National Committee on Radiation Protection and the International Commission on Radiological Protection. There is no official relationship between these two bodies, but there is some overlap of membership and they have always worked in the closest of harmony. In fact, there is no basic difference between the recommendations of these two bodies. Their recommendations are frequently couched in different terms and often one body will deal with matters not touched upon by the other. Wherever both bodies deal with the same matters their recommendations so far have without exception been in close accord.

From its inception, about 30 years ago, until about 7 years ago, the NCRP held fast to the attitude that it would be unwise to attempt to put its recommendations in the form or regulations that would presumably have to be enforced in detail. However, by 1952, it began to become evident that the situation in this regard was changing and that whether the NCRP liked it or not various bodies, State, national, and local would almost certainly be going ahead with the development of regulations for their own use. This became clearly evident ot the people in the Public Health Service who are beginning more and more often to receive requests from States as to how they should proceed in this matter. Because of these developments a conference was held about January 1953, between representatives from the Public Health Service, the American College of Radiology, American Medical Association, and the National Committee on Radiation Protection. As a result of these discussions the NCRP agreed to undertake a study of the problem in particular in relationship to the type of inquiries that were coming in to the PHS. I would like to explain at the outset that a project of this general type has always been regarded as somewhat out of character for the NCRP. In general the

NCRP develops philosophy and data of the type that might be needed in codes and regulations but almost without exception the committee has itself avoided the development of codes. Furthermore, the committee has not been in the practice of dealing in legislative, legal, or regulatory matters.

The program of radiation regulations was, however, started in order to meet a need that clearly was not being met in any other way or by any other group. It was felt that failure to do this would almost certainly result in a chaotic situation with many States developing conflicting regulations. The original policy with regard to this particular study was not to publish it but to make it available on demand. However, even before the report was finished, word about it had gotten around to the point where the immediate demand for it was much greater than we could expect to meet by the circulation of mimeograph copies. The published report was issued in December 1955, since which time the Government Printing Office has sold about 12,000 copies to the public.

At about the same time that the NCRP was working on the development of a philosophy and plan for radiation regulations, the AEC began their own work along very similar lines. It was determined from discussions with AEC people that their regulations would be designed to cover only those situations which came under their statutory authority. This meant that the AEC regulations would apply specifically to only some 5 percent of the total radiation insult to our people as a whole. The other 95 percent is produced by radiation sources not under AEC control. It was, therefore, the intent of the NCRP to develop a plan covering all sources of radiation without exception. This necessitated some considerations beyond those being contemplated by the AEC.

As I mentioned, in December 1955, the NCRP published its report entitled "Regulation of Radiation Exposure by Legislative Means." This was printed as NBS Handbook No. 61 and I would like to file a copy of this with the committee.

Representative DURHAM. We will be glad to have that publication on file.

(Excerpts from NBS Handbook No. 61 are reprinted on pp. 241–269 of the Joint Committee print entitled "Selected Materials on Federal-State Cooperatiion in the Atomic Energy Field.")

Mr. TAYLOR. Thank you, sir.

The report consisted essentially of three parts. The first part consists of an overall discussion of the problem of radiation protection regulations, calling attention to advantages and disadvantages of certain courses of action. From this discussion the NCRP developed some conclusions of its own, and these were reflected in the more specific suggestions contained in the two appendices.

Appendix A of the report gave a suggested State Radiation Protection Act. This was designed in the main to cover those points that the committee felt to be more essential should any State not already have clearly defined ideas of its own. This legislative pattern was more or less along the lines of various other acts in other fields that have been found useful and workable by State health agencies.

The committee makes no pretense of being expert in legislative matters and now that other bodies have become active in this field the

committee intends to discontinue any direct interest in this aspect of its work. While I believe that the members of the committee by and large care less for the program proposed by the Council of State Governments than our own proposal in the 1955 handbook, we nevertheless will not attempt to promote further the suggestions contained in our original report.

Appendix B contained a set of suggested radiation protection regulations that we felt might be adaptable possibly with some minor technical changes by most States. These regulations essentially embodied a compilation of the most essential radiation protection features drawn from all of the past NCRP recommendations. They were designed to cover all kinds and sources of radiation. No very serious attempt was made to put these regulations in what would normally be regarded as acceptable legal style. On the other hand, the suggestions were in sufficiently good legal form as to be found usable by several States with virtually no change.

In preparing these suggested regulations, the NCRP itself has regarded them principally as a pattern. It has expected and hoped that anybody using them would examine them with care and make such changes as might be necessary in order to fit into their normal legal practices.

As a result of this early activity of the NCRP, it has been gratifying to find that the basic technical aspects of these regulations have been followed with a very high degree of uniformity by many States and by the AEC. I am unaware of any differences between any of the regulations developed by these groups that are of any great technical significance. There are some differences that may have legal significance, but even here I believe that for the most part they are relatively minor.

This high degree of uniformity has come about in part because even during the period when we were working on our own suggested regulations, we collaborated closely with the AEC and the various States who were engaged in similar projects. We supplied these groups with draft copies of our work as it developed. As a result we were able to profit by their experience and they were able to profit by ours.

From time to time people looking for differences between things report that there are differences between the NCRP and State or Federal regulations. That there are differences is without question. Whether these are of any import or not is another matter. For example, Professor Frampton in his excellent paper on this question drew attention to a number of differences between the AEC and the suggested NCRP regulations. He was correct in the points that he developed. But I would like to emphasize that the technical differences to which he called attention were trivial and of no consequence. There were legal differences brought about in part because in any legal situation a problem has to be all black or all white. In making them all one way or the other, the AEC has been compelled for reasons which we well understand and appreciate, to be more specific in some areas where we think that such specificity is not technically valid. In spite of these differences, the basic concepts and the basic standards are identical.

The original committee preparing handbook 61 was made up mainly of radiation physicists, physicians, and Public Health officers. It also

had the informal assistance of an attorney experienced in public health legislation. However, to be certain that our recommendations would be more usable under a wide variety of circumstances, mimeographed copies of the final report were sent out to State health and State labor officials, law schools, attorneys experienced in atomic law, and any others that we could think of who might be knowledgeable in the field. In all some 200 or 250 copies were circulated. Replies were received from many of those to whom copies were sent, and we believe that full advantage was taken of their constructive comments.

It was the intention of the NCRP upon the completion of handbook 61 to discontinue its activity in the field of radiation regulations. However, there has been a continuous flow of requests for consultation and assistance from various States and local bodies with regard to radiation protection regulations ever since the report was released in 1955. However, circumstances have shown that this report still remains essentially the only basic pattern for radiation protection regulations and hence there is a continuing need for it as additional States start to enter the radiation regulation field.

In January 1957 the NCRP made some basic changes in the maximum permissible dose levels. These resulted from their own considerations, as well as those of the ICRP. It was, therefore, felt necessary to revise the suggested regulations contained in handbook 61, at least to the extent of putting in the newer maximum permissible dose values in accordance with the 1957 recommendations. Not to do this might easily result in some less experienced groups confusing the old recommendations with the new.

We have also found that while some States modified the suggested regulations to suit their needs, others adopted them essentially verbatim. As I mentioned above, it was never our intention to have this done, but we were in no position to control the situation. Therefore it was decided that as long as we were making some technical changes, we would also attempt to sharpen up the legal language. Accordingly, in 1958 the subcommittee was reorganized under the chairmanship of Mr. W. A. McAdams. The new committee continues some of the original members, but its base of competence has been substantially broadened. At present it includes, among others, representatives from the Public Health Service, the Atomic Energy Commission, and from several State agencies having experience in matters of radiation protection. In addition, an advisory group was established. This contains additional representatives from States and also a number of individuals having substantial experience in the various practical aspects of radiation protection. This committee has been working diligently for the past year and is now preoccupied with its sixth and we hope final draft. This will probably not be ready for several months yet. However, the fifth draft is probably not very far from final and if your committee would like, we can give you a copy for the record.

Representative DURHAM. We would like it, Doctor.

Mr. TAYLOR. I would be very happy to send you a copy of that.

(The paper referred to was not available at the time of publication.)

Mr. TAYLOR. I would like to emphasize that upon the completion of the present study the NCRP fervently hopes that it can retire permanently from the business of formulating radiation protection regu-

lations. In the meantime, of course, we appreciate we have had a lot of experience in this field and will be happy to work with any groups to whom we may be of assistance.

The revision of our report contained in handbook 61 will leave the basic discussion unchanged. This has been reviewed and we see no particular reason for changing any of our views from what they were several years ago.

Appendix A giving a suggested radiation protection act will either be left as it is without comment, or will be omitted entirely. It is understood that some States have adopted this pattern and on the chance that others may have an interest in some phases of it, it may be continued.

As I mentioned earlier, the Council of State Governments has developed a different pattern of operation. The NCRP has decided that it does not wish to take any official position one way or the other with regard to the strictly legislative matters. We are concerned mainly that any legislative pattern that may be adopted by the States is operationally satisfactory. The best legal means for accomplishing this is something beyond our competence.

As I have have already noted, appendix B containing the suggested regulations, will be revised. The new pattern will follow as closely as possible the old, because the old pattern has already come into use in a considerable number of States. The suggested regulations as previously published and as now being redrafted would be equally well usable under any of the legislative patterns with which we have any familiarity.

To anticipate a question possibly before it is asked, I would like to state the NCRP takes no position whatever as to whether the regulation of radiation should be solely a Federal matter, solely a State matter, or a combination of the two. From a purely operational point of view, this would appear to be the kind of a task that would be almost impossible to carry out on an adequate scale as a Central Government operation. On the other hand, most of the States are a long way away from being able to handle these highly technical problems by themselves. The suggested regulations in our reports were designed to a major extent with the needs of States in mind. We believe, however, that they can be equally well used either by the Federal Government or even by a unit as small as a city government.

Thank you very much, sir.

Representative DURHAM. Thank you very much, Doctor.

Usually you leave us a very fine statement.

I have here before me page 5, appendix B, of the report 61. At the present time approximately how many States have adopted that?

Mr. TAYLOR. I do not know exactly. I think that perhaps three or four States have adopted appendix B in virtually the same form in wihch it appears in the handbook. A number of other States have reworked it, keeping the basic principles, but not using precisely the same form.

Representative DURHAM. Was there any difference of opinion between the NCRP and the Council of State Governments? Was the approach the same, or was it different?

Mr. TAYLOR. As far as the technical regulations are concerned, I know of no difference in approach. In fact, I do not believe that

the Council of State Governments has made any particular statements with regard to the technical regulations. I could be wrong about this.

As far as the legislative pattern is concerned, there is a difference of approach, but I do not feel really qualified to discuss this.

The NCRP had the feeling at the time that it made its first proposals that this type of regulatory activity could probably be absorbed in one of the existing State organizations, such as the State health department. I believe that the Council of State Governments recommends the establishment of a central cordinator for handling all such matters.

Representative DURHAM. I think your group, Doctor, have done a very fine service for the country. I like to have agencies act freely and speak their minds and come up with things like you have done in this report. I am a little disturbed by the fact that you suggest this NCRP going out of business. We feel like the task before us is still one of a tremendous nature and in no way finished at the present time. I do not like to work a good horse to death, but it seems to me we will need a lot more help in the future from people who are informed in this field and people know what they are doing, so we can be guided and the country can be guided by the best brains and the best advice we can secure.

Mr. TAYLOR. It is very gratifying to hear you say that, Mr. Durham. I did not mean to say that the NCRP as a group is going to close shop. I merely meant to say that they do not expect to go further into the regulatory aspects of the work.

Representative DURHAM. I misunderstood your statement. I thought you said there would be no further use for your agency.

Mr. TAYLOR. No, sir. this particular committee activity represents only one committee activity out of 18. We intend to actively continue all the others.

Representative DURHAM. You do intend to continue this committee on in the future?

Mr. TAYLOR. The committee as a whole, by all means.

Representative DURHAM. Mr. Bates?

Representative BATES. Doctor, in your 1955 report, on page 10, you comment upon what the various States are doing in reference to registration or licensing and AEC licensing, and you wound up with this sentence: "Confusion is well on its way."

Do you want to advise us if that confusion has been disspelled by this time?

Mr. TAYLOR. May I just glance at this paragraph a moment, sir?

No, sir. The situation as then discribed was one that appeared to exist at that time. I think that because the States that were then concerned were working closely with our group and with other groups, these various and different approaches were reconsidered and the difficulties resolved.

I believe that you will find that at present in this country, almost without exception, registration of radiation sources is the major requirement. Whereas some States had very definitely in mind specific licensing, before any piece of equipment could go into use, I believe this is not now required by any State. I could stand correction on this, but I believe that statement is correct.

I hope that at some time in the future we will find that registration and inspection will be carried out by suitable agencies. I hope that this technique will suitably provide the control that we need, and that we will not be compelled to go into licensing, which is complicated, slows matters down, is costly, and as a rule does not accomplish a great deal.

Representative BATES. How about AEC-produced radioisotopes?

Mr. TAYLOR. The law requires the licensing of their operations. I was thinking more of the 95 percent of radiation sources that are not covered by AEC. I am assuming that the AEC licensing requirements will be continued in some form or other indefinitely. But that, bear in mind, covers only something in the order of 5 percent of our radiation sources.

Representative BATES. Do you feel that these radioisotopes which are used are handled by people who are sufficiently advised as to the possibility of danger?

Mr. TAYLOR. Radioisotopes such as licensed by the AEC?

Representative BATES. Yes.

Mr. TAYLOR. My answer to that question would have to be, "Yes, I do think so."

Representative BATES. Someone expressed the view when they appeared here, as I recall, that although the license is granted to one party, oftentimes they are used by other people, who were not granted the license. Is that a true statement?

Mr. TAYLOR. I am not qualified to answer that. I think that if this were the case, it would probably be in violation of the AEC regulations. Dr. Dunham would be much better qualified to discuss this than I, but it is my understanding that wherever radioactive isotopes supplied by the Commission are used in connection with human beings, the entire situation, involving the qualifications of the personnel, the equipment, and everything else, is carefully studied before permission is granted. And so, also, where radioactive material is not being used on human beings but in the laboratory, they have to meet some very stringent requirements before a license is granted to them.

And this, by presumption, requires that the people who are going to be using the materials within the laboratory are also adequately trained.

Representative DURHAM. I think that is one thing, Doctor, that people do not generally realize. Of course, we have received a lot of letters, and we are kind of the guilty parties in these radiation hazards, but only 5 percent comes from the AEC and the other 95 percent is coming from sources that have been here with us for a good many years. They just do not seem to realize that fact. And we are the ones catching the wrong end of this thing.

Chairman ANDERSON. In response to a question of Mr. Bates, it seemed to me you indicated there was not much licensing going on in the States, and small possibility for it. Do you think there is any headway in that direction?

Mr. TAYLOR. I think at the present time, Senator Anderson, no States are requiring the licensing of radiation equipment. Let me put it that way.

Chairman ANDERSON. Let me read to you from the Minnesota State board regulations, regulation 1158b:

> Before the construction of any nuclear reactor or facility is started within this State, a general description thereof shall be submitted to the State board of health containing such information * * *

and so forth. Then in c:

> No part of the construction of a nuclear reactor or facility shall be started within this State without the express approval of the board of health until 30 days after the submission to it of such description and information.

And then it goes on to say that:

> Within 30 days after such submission the board of health, or its duly authorized agents, may require the submission of additional information relating to any specific matter referred to herein, and the board of health, or its duly authorized agents, may object to any part of the proposed design, description, plans, method of operation, standards, or safety measures, upon the grounds that the public health is endangered, and may require such modification in such design, plans, method of operation, standards, or safety measures as will eliminate the danger to the public health.

Is that not pretty plain?

Mr. TAYLOR. Yes, sir. I am sorry. In my discussion I should have made it clear that in any matters that come under the AEC regulations and licensing procedures, there may well be licensing requirements by the States also. It is in all of the other areas, as far as I am aware, that no specific licensing is required.

Chairman ANDERSON. Had the State of Michigan had something like this when Detroit Edison was coming up, there could have been quite an argument.

Mr. TAYLOR. There could have been.

Chairman ANDERSON. The State might have said, "Yes," and the Federal Government might have said, "No." Who would win?

Mr. TAYLOR. Who would what?

Chairman ANDERSON. Who would control?

Mr. TAYLOR. I am not sure I could answer that. I would presume that the Federal regulations would be preemptive in this case, but I am speaking out of my proper competence at this point.

Chairman ANDERSON. Are there not lots of States that think they have something to say about public health and safety? I do not believe that is one of the fields surrendered by the States under the Constitution.

Mr. TAYLOR. From a purely practical point of view, I think the States have some definite obligations in this respect. From the legal point of view, I would not know. I would not have any opinions, at least.

Representative BATES. Doctor, is it a fair statement to say that recommendations of your committee are predicated more on occupational rather than environmental hazards?

Mr. TAYLOR. The work of the committee was originally oriented with respect to occupational hazards. That is correct. Specific recommendations have been made for the radiation worker. This is the occupational hazard. This is a situation controllable by the operator of the installation.

It also has been specific about recommendations for radiation that may escape from any radiation installation, be it an X-ray machine

or an atomic energy plant. It has made recommendations as to how much exposure people outside of the installation can receive from operations inside the installation. It has made specific recommendations with regard to the overall population dose, from background medical and all other sources of radiation. These were contained in our 1957 recommendations.

It has not made a statement with regard to individual doses that people in general may receiver, from manmade sources of radiation, aside from that which escapes from installations.

Does that answer your question?

Representative BATES. Yes. But why do we not pursue this environmental matter a little more?

Mr. TAYLOR. It is being pursued very actively, sir. The ICRP, as you know from the hearings last week, has made some suggestions along this line—not recommendations but suggestions—as to one way of solving this problem. The NCRP has this same question under very active study. It has been under active study, in fact, since about 1956, shortly after after the National Academy report was released.

Representative BATES. Both of these things vary in degree at different times and different places. I just wonder why we do not start out with the environmental dose and build on that, rather than saying that environmental dose is a percentage of occupational dose. Why do we not reverse that and start with the foundation stone and build up from that point?

Mr. TAYLOR. Well, perhaps you have heard the testimony on this question that Dr. Crow presented at the fallout hearings 2 weeks ago. He is a member of the NCRP subcommittee that is studying the population dose question, and he pointed out at that time that we are beginning to look at this from the point of view of its relationship to background radiation.

Now, this really is not a new approach. The ICRP, at the time that it made the suggestion in its report released last month, did not refer to background radiation. However, in actual fact, the suggested pattern that it presented was based on bringing the levels down to something of the order of natural background.

Representative BATES. Would it be necessary for us to set up new standards for environmental dose? Or could we use the same standards as we used for occupational?

Mr. TAYLOR. Well, as for the standards for occupational exposure, let me put it this way: While we consider it to be reasonably acceptable for radiation workers, to accept the levels that we recommend for them, this is predicated in part on the fact that a relatively small number of people will be involved. If the entire population were exposed to these same levels, we feel certain, or almost certain, that they would be unacceptably high. So you have to have different levels, depending upon the size of the group which you are working with.

Representative BATES. Of course, that one person that might get killed or might die—it does not make any difference to him whether it is 1 percent or whatever it is. He is gone.

Mr. TAYLOR. Yes, sir. And this is the real deep moral and philosophical problem that faces us all the way through this problem, because as many witnesses have explained to this committee in the last

few weeks, our standards are set on the basis of the absence of an observable effect. We think this is a reasonable and a fairly conservative approach. But we cannot be sure. It is going to take us a great many years, as far as somatic effects are concerned, to really determine whether this is the case or not.

Representative BATES. People living in a certain environment have a more constant exposure factor than one in an occupation where they are exposed only a portion of their working day. So you do have a little different situation in the environment than you have occupationally.

Mr. TAYLOR. This is correct. Occupational exposure may be delivered in relatively larger "chunks," with intervals between them, whereas a person living in a background of radiation receives a lower level of exposure, but he receives it steadily.

Representative WESTLAND. I would like to ask something about this National Committee for Radiation Protection. As I understand, you were formed sort of voluntarily about 30 years ago.

Mr. TAYLOR. That is correct, sir.

Representative WESTLAND. You have no legal status?

Mr. TAYLOR. This is correct.

Representative WESTLAND. You have no political status? I mean, you are not a branch of the Government?

Mr. TAYLOR. This is essentially correct.

Representative WESTLAND. You make recommendations, but there is no penalty involved; for example, if there are violations of your regulations?

Mr. TAYLOR. Correct.

Representative WESTLAND. Nevertheless, your regulations, as I understand it, are accepted pretty much throughout the country, where radiation problems on exposure are involved; is that right?

Mr. TAYLOR. This is correct.

Representative WESTLAND. It would seem to me, then, whether or not you like it, through the stature of this committee, you are the father of the child. And since people do observe and pay attention to what you recommend, and you have established this position, it would seem to me that you should continue to rear the child, let us say, and carry this thing further. Why do you, in your statement here, try to deny this obligation, as it seems to me?

Mr. TAYLOR. No, sir. My statement should not have been interpreted in any way at all as suggesting that the committee as a whole expects to discontinue its operations. Quite the contrary; there is more pressure being put on us to expand some of our activities.

Representative WESTLAND. I think rightly so, too.

Mr. TAYLOR. The part that we would like to discontinue is the part that brings us into the legal problems—the regulatory problems.

Representative WESTLAND. Yet your recommendations, as you said, have been adopted verbatim by many States. If that is the case, then you obviously are or have been on a somewhat regularatory basis. In other words, I do not see how you can draw up recommendations and have States adopt them if you do not believe, yourself, that they are adequate. Then you are doing something that could, in fact, be bad.

Mr. TAYLOR. No, sir. We do believe that the recommendations we have recommended are adequate. We believe this very firmly. It is

our hope that matters of this sort will become sufficiently well taken over by Federal or State Governments that we will be able to withdraw from those parts of the problems which are nontechnical—that is, we would like to withdraw from the legal aspects of the work.

Representative WESTLAND. Doctor, you have 30 years of background in this field. Is there any other body of Government that has a background like this one has?

Mr. TAYLOR. Perhaps not. I do not really know. I should say—as I think I intimated in my testimony—that we have had no intention of simply abandoning this child on the doorstep.

Representative WESTLAND. Well, as I said, you are the father of this child, and you should rear it, now, I think.

Did we not see in the paper that some mother was pregnant and came down here worried about the child being deformed? We ought to take a look at the rocks around the country and that sort of thing. Perhaps your National Committee on Radiation Protection is the proper vehicle to reassure some of the people of the country as to what the actual conditions are. Somebody has to do it. We try to.

Mr. TAYLOR. I could not agree with you more, Mr. Westland. Our committee has been trying in various ways, not just to reassure, but to place this problem in its proper perspective. We do not want to reassure unless we have good grounds for reassurance. Nor do we want to palliate something that is bad.

There is an enormous need for some kind of balanced education of the public in these matters. Radiation is not all bad; and it is not all good, either. Somehow this has to be explained to the public, because whether we like it or not, we are going to have to live with radiation for the rest of our lives—more radiation than we have been used to living with.

Representative WESTLAND. A committee like this can be accused of many things—political speeches, that sort of thing, an ax to grind—whereas an organization such as yours—purely voluntary, with no official status, consisting of some of the best scientists of the country—it seems to me their word would be accepted by the people of the country if you would come out and carry this thing a bit further. Do not hide your light under a bushel. Let us try to help this picture.

Mr. TAYLOR. Well, I am sure we will. And perhaps in view of the points that you have made about this particular phase of our work, we will think a little more about it before we abandon this one particular project relative to regulations.

Representative WESTLAND. I certainly hope you will.

Representative DURHAM. Mr. Ramey?

Mr. RAMEY. Dr. Taylor, in terms of getting perspective on the relative amounts of radiation from various sources, I believe in the paper that you or your organization prepared on "Radiation Hazards and Workmen's Compensation," page 17 of the JCAE print you give a relative comparison based on the so-called man-rems per million persons. You say that for persons accumulating radiation, up to the age of 30, natural radiation gives you about 4 million man-rems, medical irradiation gives you 5 million man-rems, occupational exposure gives you around 150,000 man-rems, radiation around atomic energy installations gives you around 150,000 to 450,000 man-rems.

Mr. TAYLOR. The 450,000 would be under the old recommendations.

Mr. RAMEY. Yes. And under the new standards, what would it be?

Mr. TAYLOR. It would be 150,000.

Mr. RAMEY. Right. Fallout gives you 200,000 man-rems. And, presumably, if you get all of the fallout that is still up there, that might double, so that it would be 400,000.

Mr. TAYLOR. Actually, we took the liberty of doubling that particular figure in the first place. The figure prepared by the National Academy originally was 100,000. We were just conservative and said 200,000.

Mr. RAMEY. That 200,000 would be about 5 percent of your natural background, and I think our fallout is such that by the time you get everything down it will probably be something greater than 5 percent of natural background, maybe up to 8 or 10 percent. But your total then would be 9.8 million of these man-rems, and I believe your maximum permissible dose was 14 million. So that gives you a balance left of 4,200,000.

In terms of getting perspective on this, looking to the future, do you look to see how you should sort of budget your radiation between types of exposure? For example, on this list here, you do not have waste disposal, which is sort of an unknown quantity. If you do not get any leaks in tanks very much on your high-level exposure, you will not have any appreciable exposure from that. But you will have a normal low-level amount from other types of waste disposal. There may be other growing amounts of radiation. How do you keep the perspective there?

Mr. TAYLOR. This is the very point that was dealt with in the ICRP report. They were discussing the problem of budgeting this extra radiation—or permissible radiation exposure, if you want to put it that way. They were suggesting a way of budgeting that for future operations, and theirs was just one of many ways that it might be budgeted. But surely we have to face the possibility of increases in radiation uses in certain areas, power reactors, waste disposal from power reactors, and so on. And it is important to begin thinking about this at the present time. We are in no position now to provide a specific solution that we could expect to be valid for many generations to come. We are talking in terms of generations here when we consider the budgeting of this extra, roughly, 4 million or 5 million man-rems per million population. Does that answer your question?

Mr. RAMEY. I think so. I gathered that the ICRP was looking at things as they are now, rather than predictions on increasing amounts from any one source.

Mr. TAYLOR. Well, in a sense they were, yes. The base figure that the ICRP was referring to is the same as this 14 million man-rems. In their considerations, they excluded background radiation and medical radiation. Those are the two big items that were listed. This leaves you with about 5 million man-rems, of which a small part is already being taken up by radiation workers, environs of the plant, and fallout. But five, according to their greater population allowance, is all we have to play with as far as we can see the situation today—and it was that five that the ICRP were examining from the point of view of budgetary purposes. And it is this same five that the NCRP is also looking at, with regard to future situations.

Representative DURHAM. Thank you very much, Doctor.

The next witness is Commissioner Graham.

Glad to have you with us, Mr. Commissioner. You may proceed with your statement.

STATEMENT OF JOHN S. GRAHAM, COMMISSIONER, U.S. ATOMIC ENERGY COMMISSION

Mr. GRAHAM. Mr. Chairman, I have a prepared statement. With your permission I will proceed with it.

The calling of this hearing by the Joint Committee on Atomic Energy to consider the responsibilities of the Federal and State Governments in the atomic energy field marks a milestone in the development of atomic energy in the United States. It is still only 13 years or so since the subject of atomic energy was first formally considered in the Congress by the Special Committee on Atomic Energy under the chairmanship of the late Senator Brien McMahon. At that time those of us who were not participants in the wartime atomic bomb project, and all the agencies of Government and private organizations which have since become involved in atomic energy, were largely ignorant of both the promise and the problems of peaceful uses of the atom. Indeed, as Senator McMahon said to the scientists the first task of his committee was "to go to school."

The history of atomic energy since 1946 consists in major part of the dissemination of an ever-increasing store of knowledge and of increased activity in the atomic energy field by many different kinds of public and private organizations.

Under the Atomic Energy Act of 1946, atomic energy remained largely a Federal monopoly. By 1954 it was apparent that the time had arrived to modify the Atomic Energy Act in order to permit independent uses of atomic energy in a manner consistent with our national traditions and policies in other fields. So, too, it now appears that the time has arrived to consider the extent to which the responsibilities of our Federal and State Governments for controlling radiation hazards from peaceful uses of atomic energy should be readjusted in a manner consistent with our national traditions and policies in other fields.

Since its inception, the Commission has been very sensitive to the interests of the States and anxious to do what it could to be informative and helpful. We have also been very aware of the assistance which the States can and have provided to AEC in carrying out those responsibilities. Although many of the cooperative activities which we have undertaken with State agencies have been designed to meet particular problems, many of them have been undertaken to carry out the Commission's policy to assist State agencies in the performance of their own responsibilities and to help them prepare to assume more extensive responsibilities.

The Commission has instituted a number of specific programs designed to assist and cooperate with the States. For many years Commission representatives have participated in the activities of local and regional commissions in such fields as environmental sanitation, water pollution control, and the like. We notify appropriate State agencies of licenses issued and have invited representatives of State agen-

cies to participate in the Commission inspections of licensed activities.

We called a meeting of interested State and Federal officials in Washington in 1955, shortly after completion of our first set of regulations. At that time, we briefed representatives of some 37 States concerning regulations then in effect or under consideration, and discussed generally the role of the States. Following that meeting, we established an advisory committee of State officials to advise us in the preparation of regulations to establish "Standards for Protection Against Radiation" (10 CFR, pt. 20).

We have also set up a system to notify appropriate State officials of applications for commercial waste disposal and of all applications to construct and operate nuclear reactors. We have conducted and attended meetings with State agencies and legislatures to familiarize them with Commission procedures and requirements and to assist them in considering problems of radiation protection, insurance, workmen's compensation, and other problems confronting them. We are working closely with a subcommittee of the National Committee on Radiation Protection to develop a model revised State regulation for protection against radiation hazards.

Many State universities and colleges are doing research work on problems of radiation under contracts with the Atomic Energy Commission and many State agencies are engaged in research activities in the atomic energy field under Commission contracts. We have cooperated and assisted in the establishment of many State and local educational and training programs in the atomic energy field. The financial and other support which the Commission has given to these programs has contributed tremendously toward creating a manpower pool on which the States can draw for personnel and assistance in establishing and carrying out their own radiation protection programs.

In the spring of 1958 the AEC announced plans for providing radiological assistance to States and local governments in the case of a serious accident involving radioactive material. These procedures have been coordinated with interested State and local officials.

One of the first major steps taken at the State level to promote and regulate peaceful uses of atomic energy took place in 1954 when the New England Governors' Conference established a committee on atomic energy. That committee published a model State bill in 1955 which, with a number of changes, was included by the Council of State Governments in its recommended legislative programs for 1957 and 1959. Legislation similar to this bill has been adopted in about 11 States. This bill provides for a State coordinator of atomic energy, requires State agencies to examine the adequacy of existing State laws and regulations in light of atomic energy developments and prohibits the possession without a license of materials and facilities for which the Atomic Energy Commission requires that a license be obtained. In approximately eight States, comprehensive radiation safety regulations have been adopted by departments of health or industrial safety.

Considerable attention has been devoted during the last few years to the need for clarification of the responsibilities of the Federal and State Governments for regulating atomic energy. In 1957 a Joint Federal-State Action Committee was appointed by the Governors of the 48 States and the President. The Committee issued a report in December of that year recommending that the Atomic

Energy Act of 1954 be amended in order "to clarify the roles of the Federal-State Governments, to make possible the assumption of greater responsibilities of the States in the future promotion and regulation of the peacetime uses of atomic energy."

Bills providing for readjustment of Federal-State responsibilities in the atomic energy field were introduced by Congressman Durham and Senator Anderson in January 1956, and January 1957, respectively (H.R. 8676, 84th Cong., 2d sess.; and S. 53, 85th Cong., 1st sess.). Essentially, both bills provided for turning over areas of the Commission's regulatory responsibilities to the States when the States become competent to exercise such responsibility.

The bill which the AEC submitted to the Joint Committee in June 1957, adopted a different approach, primarily in that the Commission's bill would have provided for the exercise of dual or concurrent jurisdiction by both the AEC and the States over activities licensed by the Commission.

Since June 1957 we have reexamined the entire problem and the three bills referred to. As a result of our study since that time we have decided that the general approach incorporated in Congressman Durham's and Senator Anderson's bills is preferable to that incorporated in the Commission's proposed bill of June 1957. The proposed bill which the Commission sent to the Joint Committee last week, May 13, and which was introduced yesterday by Mr. Durham, H.R. 2714, adopts the basic approach to this problem which was incorporated in Senator Anderson's and Congressman Durham's bills, although there are differences in procedures and the provisions of our proposed bill are considerably more detailed. The bill submitted last week contains a number of modifications made since an earlier version of the bill was furnished to the committee in March of this year. We have been advised by the Bureau of the Budget that the adoption of legislation along the lines of this proposed bill would be in accord with the program of the President. We will be prepared to discuss the provisions of the new bill on Thursday, May 21.

Our presentation today is designed to indicate some of the principal activities in which the Commission is engaged under the present law and how we carry out our responsibilities in connection with those activities. The six areas to be discussed today are: (1) Contract operations at Commission-owned facilities which are not subject to licensing; (2) Waste disposal; (3) Training of personnel for health and safety work; (4) Inspection; (5) Reactor hazards; and (6) Licensing.

Written statements have been prepared covering these six areas, to be presented by AEC witnesses.

Representative DURHAM. Very well.

Mr. GRAHAM. As some aspects of these problems have been discussed extensively in recent hearings before this committee, our presentation will emphasize waste disposal, training of personnel, and inspection.

However, in order to place this work in perspective, we believe that an introductory statement by Dr. Charles Dunham, Director of Biology and Medicine, on the aspects of AEC contract operations would be helpful. He will also touch on the Commission's biomedical research program.

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Thereafter, Dr. Joseph Lieberman, Chief of Environmental and Sanitary Engineering Branch of the Division of Reactor Development, will discuss waste disposal, with particular reference to licensed activities.

The third witness, Mr. Oscar Smith, Director of Industrial Relations, will discuss the training of personnel.

The last witness today will be Mr. Curtis Nelson, Director of the Division of Inspection, who will discuss inspection of licensed facilities.

In the interest of economy of time, these witnesses will summarize their written statements.

Also present, representing the Commission, are Dr. Clifford Beck and Mr. Harold Price, who are available in the event that you may have questions regarding reactor hazards or our licensing activities.

If this procedure is agreeable to the committee, we will proceed expeditiously in order to avoid encroaching on the time of other witnesses who are scheduled to present their views.

In behalf of my associates I wish to thank the committee for having allotted these 2 hours today to the Commission.

So, Mr. Chairman, with your permission, I should like to ask Dr. Dunham to be our lead-off witness.

Chairman ANDERSON. Before that would you state how many States you now think are qualified to assume regulational authority over radiation sources? Are any States now qualified to do it?

Mr. GRAHAM. Mr. Chairman, it is our general feeling that there are several States which would be prepared to move forward rapidly if this legislation were passed. I think that we need the legislation to give them the incentive to really move forward.

Chairman ANDERSON. How much of the AEC budget for the fiscal year 1960 is devoted to assisting the State governments toward assuming greater responsibilities?

Mr. GRAHAM. Senator, this is spread through various divisions of our budget. Would you give us an opportunity to try to submit for the record some figures on that, that would pull these together?

Chairman ANDERSON. Yes. That would be fine. Submit a statement covering that.

(The following letter was subsequently received:)

ATOMIC ENERGY COMMISSION,
Washington, D.C., July 28, 1959.

Mr. JAMES T. RAMEY,
Executive Director,
Joint Committee on Atomic Energy,
Congress of the United States.

DEAR MR. RAMEY: At page 66 of the stenographic transcript of the hearing on May 19 before the Joint Committee concerning Federal-State relations, Senator Anderson inquired as to how much of the AEC budget for fiscal year 1960 is devoted to assisting the State governments to assume greater responsibilities for regulation of radiation sources.

The Commission's programs to assist States to assume greater responsibilities for regulating radiation sources were described in detail in the testimony presented by Commission representatives at the hearings. With the exception, however, of one item of $100,000 for the training of State employees exclusively under the radiological physics fellowship program, the Commission's budget does not separately identify costs to be devoted solely to the purpose of State assistance. The reason is that the listed programs also serve other purposes and the amounts for State assistance cannot be practicably separated.

We have not considered that it would be feasible, for example, to determine how much of the cost of our programs in radiation protection might reasonably be allocated to the purpose of assisting States even though these programs represent a major source of information and assistance to those States interested in developing plans for regulating radiation sources. Similarly, with respect to contracts with State universities and colleges for research and training, there would be no reliable basis for determining what portion of the contract costs might be attributable to assisting the States in developing scientific and technical competency for dealing with radiation protection problems.

Another important source of assistance is through direct contacts of the Commission's staff with the agencies of those States currently interested in radiation protection. The Divisions of Biology and Medicine, Inspection, Licensing and Regulation, and Reactor Development, and the Office of General Counsel devote many man-hours per year to working with and advising State agencies on problems in this field. It has not been our practice, however, to keep account of the staff's time given to this work. For this reason and because of the variety of interests concurrently served by the programs referred to in the testimony, any estimate of the portion of cost assignable to State cooperation and assistance would, we believe, be necessarily arbitrary and possibly misleading. It is to be noted, however, that the potential value of these programs to the States is one of the factors upon which their justification is based.

Sincerely yours,

A. R. LUEDECKE, *General Manager.*

Chairman ANDERSON. Dr. Dunham?

STATEMENT OF DR. CHARLES L. DUNHAM, DIRECTOR, DIVISION OF BIOLOGY AND MEDICINE, ATOMIC ENERGY COMMISSION

Dr. DUNHAM. Mr. Chairman, my testimony will be in three parts. The first has to do with the impact of our biomedical research program on State regulation health activities. Then there will be a statement on the onsite regulation control within AEC installations; and finally a brief statement on the standards of radiation protection. The latter I wish to introduce into the record and will not read. (See p. 38.)

The Division of Biology and Medicine, in fiscal 1959, has a $43 million research program and a $2,500,000 training program, each with varying degrees of impact on radiological health activities: $18,760,000 is spent on research directly related to development of information needed by such bodies as the National Committee on Radiation Protection for promulgating recommendations on permissible levels of exposure to radiation; an additional $4,064,000 goes for research, which is aimed at developing a comparable body of information for standards involving environmental contamination and waste desposal. This money is exclusive of the $2,648,000 being spent on fallout measurements in air, soil, plants, food, and people and the many millions spent at AEC sites on housekeeping activities which are providing basic data for the environmental standards. We spend $2,083,000 on dosimetry and instrumentation work; $1,440,000 on research toward better methods of radiation protection; $919,000 in radiation measurements, and $3,632,000 on research related to prophylaxis and treatment of radiation injury; a total of $30,898,000 plus the fallout studies. This information is all freely available to State health authorities for their information and guidance as they develop more and more active programs in radiation health protection.

Much of our research effort is carried out at State and private universities and colleges. For instance, we support research in 47 differ-

ent States, including Alaska, and in 45 different States we support 222 projects, which involve research conducted at 69 different State-supported institutions. And of the 36 universities and colleges which sponsor the Oak Ridge Institution of Nuclear Studies, 25 are State supported.

This research program has not only met the AEC's needs, but it is developing across the country a body of scientists trained in the safe use of radioisotopes—and in many instances scientists extremely knowledgeable in radiation medicine and radiation problems, generally, who are now serving on State advisory committees on atomic energy matters.

In our environmental radiation studies and our ecology research, as well as through our civil effects of atomic weapons activities, we have both assisted and asked assistance of State health personnel. For a number of years through our operations offices we loaned to State and local civil defense organizations both radiation detection instruments and radiation sources for civil defense training purposes.

When the Colorado Plateau States and the USPHS wished to make studies of the health hazards of the uranium mines, we gave technical assistance through our Health and Safety Laboratory in New York; and in addition, we funded a large share of the cost of the first few years of this program, and our Grand Junction office has from the onset given it logistic support. Through the USPHS we have funded the costs of the radiation air surveillance programs which is carried out principally in State health departments and has been very important, both directly and indirectly, in familiarizing State health personnel with certain aspects of the radiological health problem. We have cooperated with the State of New Jersey by funding a full-scale followup study of radium dial workers, and becaues of special circumstances in Colorado, we have funded a whole body radiation counter to be located at the Colorado State Health Department laboratories in Denver. Our Health and Safety Laboratory, which is closely integrated with our Washington-administered research program, has on innumerable occasions assisted State and city health officials, both by responding to requests for technical help and by performing special radiochemical analyses.

In the training and education field we have developed special fellowship courses and summer institutes and equipment grants which will be discussed by Mr. Oscar Smith.

In short, the Division of Biology and Medicine of the USAEC has from its inception endeavored through its research program and through its training and education program to develop across the country a familiarity with and an understanding of radiation. The AEC has gone further. In the course of developing programs to solve radioactive waste disposal problems, in developing an air radiation surveillance program, in providing offsite monitoring for weapons tests and in its civil effects tests programs, it has made it possible for State health personnel as well as USPHS personnel to gain first-hand practical experience in dealing with radiation health problems.

Now for a word about onsite radiation hazard control: The Commission's control of radiation hazards in its own operations follows a pattern, developed over a period of more than 15 years, to provide in the most effective and economical manner adequate radiation protection both to radiation workers and to the general public.

Essentially all of the installations owned by the Government in the name of the Atomic Energy Commission are operated for the AEC by private contractors. The contracts contain broad provisions requiring the contractor to comply with all health, safety, and fire protection requirements of the Commission. Basic standards of radiation protection and operational policies to assure that such standards are met are formulated by the Commission's headquarters staff, approved by the Commission, and administered by direction of the General Manager. In common with other AEC policies and standard operating procedures, the General Manager's instructions are published in an issuance manual, and responsibility for their application to AEC activities is delegated through the directors of the various operating divisions to the operations offices under their respective jurisdiction. The managers of operations offices, in turn, are responsible for compliance by individual contractors.

AEC contractors are responsible under general contract provisions for maintaining programs of radiation protection which meet the general standards and specific requirements prescribed by the AEC. Contractors operating nuclear reactors or particle accelerators, for example, and contractors handling large quantities of radioactive materials are required to provide highly specialized professional and technical staffs and facilities in order to handle all of the radiation protection problems involved in the operations of these facilities.

The Atomic Energy Commission, through its operations offices, maintains continuous contact with the various phases of the activities of its prime contractors. Primary responsibility for review of plant design and radiation protection controls to assure high standards of performance by the contractor in his program of radiation protection rests with the AEC Manager of Operations to whom the contractor is assigned. Detailed contact with the contractor's radiation protection program and related activities is maintained, as required, by a professional staff qualified by training and experience to evaluate the contractor's program, provide consultation both to the contractor and the Manager of Operations, provide technical liaison with the headquarters staff, and initiate appropriate investigations, reports and administrative actions. In practice, AEC contact with the contractors' programs is maintained by means of joint visits to contractor operations by representatives of headquarters and operations offices, meetings and conferences, periodic and special reports, and visits to headquarters by members of the contractors' professional staffs.

In addition to routine administration of the contractor's program, as described above, the overall performance of the various prime contractors is subjected annually to special scrutiny by their respective operations offices under the contractor-appraisal program of the AEC. This places upon the manager of operations the responsibility of reviewing in perspective the major performance, achievements, or deficiencies of contractors in the area of radiation protection.

The problems of radiation protection in AEC installations and the methods used by the Commission and its contractors to assure adequate protection have been discussed in detail in the Commissions semiannual reports of July 1950 and January 1957.

In these operations, effective control of exposure to radiation is achieved by procedures which may include any of the following steps:

(1) The operation is analyzed by persons who understand both the operation to be performed and the properties of the radiation and of the radioactive materials which may be involved.

(2) Protective measures for control of radiation both for normal operation and in case of possible accident, are prescribed as may be appropriate.

(3) The operation is discussed with persons scheduled to perform it and, if desirable, practice runs are made using dummies or other devices to permit scheduled physical manipulations without the production of radiation. In the case of an intricate routine operation discussion of the operation with operating personnel may assume the proportions of a training course with appropriate emphasis on radiation safety.

(4) Operating personnel are supplied with appropriate equipment, including devices for measurement of any exposure to radiation which may occur.

(5) The operation is monitored by persons experienced in the detection and control of radiation hazards.

In the contractor's organization, field operations of this nature are backed up by an extensive organization which provides laboratory and technical services, maintains appropriate records, follows exposure records of individual employees, investigates unusual or excessive releases of radioactivity and takes appropriate corrective action, and provides consultation and advice where needed. It is this group, organized to provide a complete radiation protection service in the contractor's operation, which is the heart of the radiation protection program. In its total program, the AEC together with its prime contractors employs over 1,000 persons of professional status in radiation protection, with about 700 supporting personnel of subprofessional status. Of this number of persons, about 70 at the professional level and about 35 subprofessional are direct employees of the Commission engaged in providing the liaison necessary to assure that the radiation protection programs of the contractors meet the Commission's standards of radiation protection.

Contractor programs of radiation protection are generally organized to include protection of persons in the environs of the operation as an integral part of the overall program of radiation protection. The numbers of employees given above include those concerned with environmental safety.

For purposes of this presentation, Dr. Lieberman will discuss in his presentation control of environmental levels of radioactivity with particular emphasis on waste disposal.

This ends my oral statement.

Chairman ANDERSON. Will provisions in AEC contracts limiting radiation exposure need revision in view of recent changes in the NCRP standards?

Dr. DUNHAM. I think only very minor ones. Very minor ones, I believe. The standards which have been recently brought out, as I recall, actually raised, for instance, the permissible body burden of strontium 90 in workers.

Chairman ANDERSON. It raised it one place and lowered it in another, did it not?

Dr. DUNHAM. It also raised it a little in the drinking water, but it would lower it in terms of certain air concentrations. But there would not be very marked changes as a result of the new standards. The basic standards were changed, as you may recall, Senator Anderson, about a year ago, which had to do with external radiation, which cut everything by a factor of three. We have been operating under that now for over a year. And that was the real change.

Chairman ANDERSON. If a State were to license in this field, would it have any temptation to pay attention to the international standards, which have been going one way, while your standards have been going the other way? How would the State know, when an international organization says it is more hazardous, and this Government says in effect that it is just liked rinking water from a spring? What would a State do, if it did not have its own staff of experts?

Dr. DUNHAM. Actually, when it comes to an operation, I think you will find there is no fundamental difference. When you get into this matter of the population as a whole, then you are in an area which is largely concerned with natural activity, fallout, and that sort of thing. But if you will recall, both the NCRP and the international organization set up certain standards, and essentially reiterated many of them, made certain changes for different isotopes, for the worker, and then for materials that could be released into the environment in the vicinity of a plant or an operation. And they are essentially identical for the two organizations.

Then, as you recall, the ICRP went further and began talking about this matter of the total population, something that was contaminating the environment clear across the board, and came up with suggestions in terms of how we can live with the atomic age if power requirements get bigger and background builds up.

Chairman ANDERSON. Are these AEC contractors subject to State regulation, regulation by State governments, we will say?

Dr. DUNHAM. I think you will have to ask Mr. Price that question. I do not know the fine points of the law. They certainly are bound by an AEC manual chapters. But what in addition happens, I am not sure, legally. Actually—and I think Dr. Lieberman will bring this out—where there is any possible conflict, they usually sit down with the State people and work out some reasonable approach to the problem.

Chairman ANDERSON. You have a lawyer with you?

Dr. DUNHAM. I have two of them here.

I would prefer to pass to the lawyers on that one.

Mr. LOWENSTEIN. I think this would partially depend on the nature of the contract and the type of contract activity. In his presentation, Dr. Dunham was referring, of course, principally to the AEC contractors who are operating at installations such as Oak Ridge and Hanford, Government-owned areas involving Government-owned facilities.

Chairman ANDERSON. But they are not outside of the State line. You heard me read this section from the Minnesota regulations. Supposing Tennessee puts in a regulation like this. Does that exempt Oak Ridge?

Mr. LOWENSTEIN. Well, sir, it is my understanding, and as I think our witnesses will bring out, we have throughout, from the inception

of the program, worked very closely with the State of Tennessee, with the State of Washington around Hanford, on problems of environmental contamination, waste disposal, and the like. My understanding is that common ground rules have been worked out, and that the standards which we have adopted and directed our contractors to observe have been agreeable to the State people. I understand common monitoring programs have been worked out. These will be gone into by the other witnesses.

Chairman ANDERSON. Do you think these AEC contractors are subject to licensing by State governments?

Mr. LOWENSTEIN. To carry on Oak Ridge? I do not, sir.

Chairman ANDERSON. Even if health standards are involved?

Mr. LOWENSTEIN. Well, as I say, we have tried not to work this out on a legal basis, but on a basis of practical comity and cooperation.

Chairman ANDERSON. Did not the railroads try to work out all of these things on a friendly basis, and then find they had to run into regulations?

Mr. LOWENSTEIN. This we have not had to face yet. There has been some correspondence between the State Health Department of Minnesota and the Atomic Energy Commission.

Chairman ANDERSON. What did you advise them?

Mr. LOWENSTEIN. We wrote back and told them that—I would like to furnish that for the record.

Chairman ANDERSON. Yes.

(The information referred to follows.)

ATOMIC ENERGY COMMISSION,
Washington, D.C., May 28, 1959.

Mr. JAMES T. RAMEY,
Executive Director,
Joint Committee on Atomic Energy,
Congress of the United States.

DEAR MR. RAMEY: As appears at page 80 of the stenographic transcript of hearings before the Joint Committee on Atomic Energy on Tuesday, May 19, 1959, Mr. Lowenstein agreed to furnish for the record correspondence between the Health Department of the State of Minnesota and the Atomic Energy Commission. There is enclosed a copy of letter dated March 18, 1959, from Robert N. Barr, M.D., secretary and executive officer of the State of Minnesota Department of Health to the Manager, Chicago Operations Office, Atomic Energy Commission; and a reply dated April 22, 1959, from Kenneth A. Dunbar, Manager, COO, to Dr. Barr.

Sincerely yours,

A. R. LUEDECKE,
General Manager.

Enclosures: As stated.

ATOMIC ENERGY COMMISSION,
Chicago Operations Office,
Lemont, Ill., April 22, 1959.

Dr. ROBERT N. BARR,
Secretary and Executive Officer
State of Minnesota, Department of Health,
University Campus, Minneapolis, Minn.

DEAR DR. BARR: Thank you for your letter of March 18 enclosing a copy of the regulations of the Minnesota State Board of Health relating to ionizing radiation.

Let me assure you that the Atomic Energy Commission wishes to work cooperatively with the State and local governments to the fullest practicable extent in matters affecting health and safety.

As you know, the Commission has observed a policy of making available to interested State and local agencies all available information as to projects such

as the Elk River nuclear power reactor. It was pursuant to this policy that Commission representatives participated in the meeting held in St. Paul, Minn., on September 8, 1958, which was also attended by officials of your State. Moreover, as indicated by the enclosed press release No. B–42, dated March 12, 1959, the Commission announced it has adopted a policy of affording members of the public and State and local agencies, opportunity to participate in consideration of the safety aspects of the Elk River project and other reactor projects in the power demonstration program. The procedures to be observed under the policy will parallel those observed in power reactor licensing proceedings. Accordingly, we will send you copies of various reports and related documents pertaining to the Elk River project as they are developed and become available.

These documents are being sent to you in accordance with the Commission's policy of making full information available to interested State agencies; and without regard to whether regulation 1158 of the Minnesota State Board of Health is applicable.

We will be happy to arrange a meeting with you or representatives of your department to discuss any questions you may have relating to health and safety factors involved in the Elk River reactor project.

Very truly yours,

KENNETH A. DUNBAR,
Manager.

MARCH 18, 1959.

Mr. KENNETH A. DUNBAR,
Manager, Chicago Operations Office,
Chicago, Ill.

DEAR MR. DUNBAR: As you may know, regulations relating to ionizing radiation were adopted by the Minnesota State Board of Health on December 4, 1958, and became effective December 18, 1958. A copy of these regulations is enclosed for your information.

You will note that regulation 1158 relates to the construction and operation of nuclear reactors and facilities. We are firmly of the opinion that the State of Minnesota has a responsibility to concern itself with the precise nature of these installations, and with the potential hazards resulting therefrom to the operating personnel, to the people of the State in general, and to the environment. This responsibility delegated by the legislature cannot be avoided or ignored by the administrative agencies who have been so delegated. We are also of the opinion that the Atomic Energy Commission would not deny the legitimate interests and concerns of State government in these matters.

Our experience extending over many years and involving many agencies has been that Federal agencies wish to work cooperatively with State and local government units in matters of overlapping authority and responsibility.

Section I of regulation 1158 states that "any facility in design or under construction as of January 1, 1959, shall not be exempt from the provisions of these regulations." The reactor for the Rural Cooperative Power Association at Elk River, Minn., is therefore not exempt. This letter therefore is an official request for your compliance with the provisions of regulation 1158 of the Minnesota State Board of Health. As the initial step in this regard we specifically request the information required in section B of this regulation. Assuming that several weeks may be required by your office to prepare the information requested, we further request that you furnish us at your early convenience with a projected date that the information requested will be available to us.

Very truly yours,

ROBERT N. BARR, M.D.,
Secretary and Executive Officer, State of Minnesota Department of Health.

Mr. LOWENSTEIN. We advised the State that, consistent with our general policy of working closely with the States, we desired to furnish them with all the information which they would like concerning the reactor that is proposed for construction within the State, and that this was without regard to the question whether or not some provisions of that regulation might or might not be legally enforcible. There are a number of information provisions in the State regulation requiring persons who propose to build reactors to furnish information. Of course, this type of thing would not present any problem.

Chairman ANDERSON. I am very much interested, because, you may recall, the attorney general of my State took a rather strong position on this some months ago, feeling that the State did have some rights in this field. And I have the feeling that other States may come to a similar conclusion at some time.

Are there questions?

Representative DURHAM. Mr. Chairman?

Dr. Dunham, I notice your total expenditures here got up to something like $30 million or more. I have always been a strong supporter of the training program, through the grants to the institutions. And on your last page, appendix B, you outline the general subjects there that are in the training program. How long must these training programs run? For what length of time?

Dr. DUNHAM. That is appendix B, sir?

Representative DURHAM. That is appendix B, sir. It is on the last page of your statement.

No, no. I beg your pardon. That is on Mr. Smith's statement.

Anyway, it refers, looking at Mr. Smith's statement, to the training program through the educational institutions.

Dr. DUNHAM. I think on page 16 I can probably speak to that.

Representative DURHAM. This is costing quite a sum of money, and I have been concerned for some time as to how we could use such trained personnel in case of an emergency. I have been a little disappointed with our civil defense training program, because we cannot get it off of Capitol Hill up here. And you people seem to have no trouble in getting your funds for this type of program.

Dr. DUNHAM. Your committee is very helpful.

Representative DURHAM. So I think we are making a mistake by not going into this program so that we would have the people in the communities in case anything happened. You are primarily concerned, of course, with the Commission's work, up to a certain point. But certainly, I think if we could assimilate all this personnel, put it in the hands of individuals where they could call on them in case of emergency, it would be far better than what we have got at the present time in civil defense.

Dr. DUNHAM. Yes. I think your point is very, very well taken.

As you know, we have a program of getting some of this put into the high schools. We have a program of training high school science teachers in radiation biology and just simple instrumentation.

The other aspect of the thing that I would like to mention, now that you have given me an opportunity, is that we have an arrangement with the Department of Defense for emergency assistance in the event of a radiation accident or disaster which involved any Atomic Energy Commission or any Department of Defense material.

We have within the last year developed and are about to finalize an interagency agreement which will bring all the other agencies, like the Public Health Service, like the Coast Guard, and so on down the line, into an organizational—it is not a highly organized thing, but into a relationship whereby if there were a serious nuclear incident somewhere, the local authorities would know how to get assistance and who could help them.

Representative DURHAM. Well, we would have to depend upon them entirely as volunteers, even after we had trained them with Government funds.

Dr. DUNHAM. Right.

Representative DURHAM. What I am thinking about is some relationship or some way that we could assimilate this and have it as a known fact that we have a lot of people already trained in this field. But they are scattered all over the country, so that we have nothing to get them together quickly.

Dr. DUNHAM. I think the work on this radiological assistance plan, as we call it—it is an interagency committee, and the Commission is having a meeting with its own staff, I think, Thursday, going over a final version of this. This I think will develop just the type of information, who has the capability, who is trained, and what organizations they relate to, if any.

Representative DURHAM. I think it is well for you to do the training, because the facilities will naturally present the hazards and some of the problems. But after all, I think it is probably the responsibility of the Office of Defense Mobilization to put this thing together and have it available in case something does happen. We have not got but one policy today, and that is one of massive retaliation. We might just as well face it. That is what it would be. Of course, it is all right for the Defense Department to have this available, but I think the civilians have a little interest in this also.

Dr. DUNHAM. A very vital interest in it.

Representative DURHAM. Very vital. I hope you will pursue that matter, since you can get the money when some of the agencies cannot get the money. And I think it will continue to be given to you, because it is a good program and a worthwhile program.

Representative HOLIFIELD. I just want to affirm what Congressman Durham has just said.

I think a great responsibility rests upon the agency, because they have a background of experience in this field and they have also been accorded a generous set of appropriations to conduct these studies. And I believe along the line of the discharge of responsibility of the agency, each one of us that has knowledge in this field has a personal responsibility that is charged to the people who do not have access to a great deal of this information. And it is my continued hope that these hearings—and hearings will be held in the future—will bring out these facts, so that people who are entitled to have them—and by that I mean the whole of the American people can have access to anything that we have in a factual way to make up their minds as to the solutions for this great problem of radioactivity.

I am hoping that the hearings on the effects of a nuclear war will receive your attention, and you will be able to bring out a great deal of information which will relate to the problems of defense which we are so interested in.

How many men have you trained in the overall program in the last few years.

Dr. DUNHAM. It depends upon the degree of training one is talking about. If you are talking about an individual whom we would call a radiological health scientist, we have probably trained, by special courses and that sort of thing, a matter of several hundred.

Meanwhile, others have developed in actual plant operations, on-the-job type of training. And as I indicated, we have about a thousand, all together, very highly trained people in our whole operations, as well as professionally trained people to assist.

Mr. RAMEY. In earlier hearings, Dr. Shields Warren mentioned studies that you had undertaken on employees as to their later work and health experience, employees who had been possibly exposed to radiation at your facilities. The committe staff followed up on that and it turned out that apparently you had not made a very detailed statistical analysis of this type of information, but that you had one possible pilot study underway at Argonne.

With your atomic energy installations, is this not one of the best sources of statistical data? You have been in operation now for 18 years. Is this not something that would prove fruitful?

Dr. DUNHAM. I think eventually it will, Mr. Ramey.

There are two problems, really. One: It is a very small percentage of the employees that get appreciable exposures to radiation.

I was interested in a paper that came out in Science just last weekend by a Canadian who figured out that you would have to have a population of 6 million in order to tell the difference in leukemia incidence among those who had a difference of as much as 5 roentgens total exposure.

The other is a matter of time. And we will certainly make such studies. And as the information we pass to you indicated, there just has not been time enough, with the low levels we are talking about, to expect anything very exciting.

You will recall that the actual incidence noted was lower than that in the population as a whole. We do not think this is a valid inference, because it is just not a complete enough study, and we do not have a big enough population with enough exposure over enough years.

Mr. RAMEY. Would not this be something that you could put a statistician on—someone trained in this sort of field?

Dr. DUNHAM. Oh, yes.

Representative DURHAM. Thank you very much, Doctor.

We will have to adjourn the meeting, and we will resume again at 2 o'clock.

We are sorry we could not get through with all the witnesses this morning, but there is a bill on the floor of the House that some of us are interested in.

Thank you very much.

The committee is adjourned until 2 o'clock.

(The balance of Dr. Dunham's statement referred to on p. 29 follows:)

STANDARDS OF RADIATION PROTECTION

In small amounts, radiation is a phenomenon of nature to which every living creature is subject. Cosmic rays from outer space; gamma radiation from radium and its radioactive decay products in the earth's crust; and alpha, beta, and gamma radiation from radium and the radioactive isotopes of hydrogen, carbon, and potassium which occur naturally in the human body, combine to give body tissues an average radiation dose equivalent to about one-tenth of a roentgen of X-rays per year. To what extent such small doses of radiation may be harmful, we do not know. Certainly the human race has developed and prospered in an environment of which this has been one of the more stable characteristics.

In much larger amounts, radiation results in observable injury to all living things. For example, an accidental exposure to three or four hundreds of roentgens of X-rays will result in radiation sickness and could, under unfavorable conditions, be fatal. At best, 2 or 3 months would be required for more or less complete recovery from apparent effects. Such recovery does not preclude the possibility of delayed effects such as leukemia or reduction in life span, nor of genetic mutation.

In routine activities involving exposure to radiation, we are concerned with doses of radiation sufficiently small that, up to the present time, the resultant effects on health cannot be observed. Nevertheless, it is considered prudent to assume that even the smallest exposures to radiation involve biological hazards which are correspondingly small. However, no one so far as we are aware proposes that there should be no exposure to manmade sources of radiation. Rather, the problem of control of radiation hazards is to limit possible risks to acceptable levels. In principle, this appears to be feasible, since we are confident that it is possible to make the resultant hazard as small as one may wish by sufficiently limiting the exposure. While we cannot estimate with confidence the actual hazards from exposure to low levels of radiation, it is believed that we can estimate upper limits which the actual hazards are not likely to exceed. The lower limit may, of course, be zero.

Exposure to manmade sources of radiation cannot be justified unless the reasons for accepting the exposure outweigh the hazards involved. This means that in any case the benefits to be anticipated from any activity involving exposure to radiation must be greater than the risk. However, it implies more than this. If there is an alternative method by which the same objective can be accomplished with less exposure to radiation, such alternative method should be used, provided that the reduction in exposure is sufficient to justify additional cost, effort, or other disadvantages of the alternate method.

To provide a reasonable balance of radiation hazards against reasons for accepting exposure to radiation involves several difficulties. Such a balance does not depend alone upon our knowledge of the relationships between radiation exposure and their biological effects. It is necessary also, but even more difficult to evaluate benefits to be anticipated from the various activities which may result in exposure to radiation. Furthermore, there are no common units of measure which can be used in comparing risk to benefit. It follows that establishing realistic standards of radiation protection involves not one but three areas in which there may be expected to be wide differences in individual judgment. These differences can be reduced in time by more precise quantitative knowledge in two of the areas—those involving the biologic effects of radiation and, to a lesser extent, the anticipated benefits from activities involving exposure to radiation. There appears no reason to believe, however, that regardless how well informed we become there will ever be unanimity with respect to the maximum degree of biologic risk which can be justified by a particular economic, social, or political goal. In a complex social structure, decisions involving such questions are valid only to the extent that they represent a consensus of well-informed persons.

One of the complications in evaluating benefits from activities involving risk from radiation is that the benefits do not necessarily accrue to the individuals who undergo the exposure. This situation is not peculiar to the problem of radiation protection. It is paralleled by other demands upon the individual throughout our complex social organization. It does, however, constitute a compelling reason to keep the risk very small. This pressure is reflected in a criterion of radiation protection, frequently quoted but extremely difficult to interpret, that the risks from exposure to radiation should be small compared to other risks which persons customarily accept.

In general, standards of radiation protection are meaningful only in relation to the conditions for which they are formulated. For example, occupational limits are designed to limit the risk than any individual employee should be expected to accept in connection with his routine duties. They may be much lower than exposures which would be appropriate in an emergency in which there were strong reasons for accepting such exposures. On the other hand, the mere existence of an accepted occupational limit does not justify individual occupational exposures to radiation which it is practical to avoid by such methods as technical improvements of process, training of the employee, and general precautionary procedures.

Even in this brief discussion of the problems involved in arriving at appropriate limits of radiation exposure, it is obvious that not only is the problem very complex but many of the considerations involved are of such a nature that one may expect wide differences in their evaluation. Occupational standards of radiation protection used in the United States and generally in other countries are consistent with basic standards recommended by the National Committee on Radiation Protection and Measurements and the International Commission on Radiological Protection with which it is affiliated. Hereinafter, these groups are respectively referred to as the NCRP and the ICRP.

The NCRP, sponsored by the U.S. National Bureau of Standards, was founded as the International X-ray and Radium Protection Committee in 1929. At the present time it consists of a main committee which has the responsibility for the commendations made by the NCRP, and a dozen subcommittees working on various aspects of radiation protection.

The main committee is composed of representatives of various agencies and organizations considered to have especial interest and competence in problems of radiation protection, plus two members-at-large. Representatives of the various agencies or organizations are specifically designated by the groups which they represent, while members-at-large are elected by the main committee. Members of subcommittees are selected by the NCRP on the basis of individual qualifications, without regard to their organizational affiliations. Currently representation on the main committee includes U.S. Public Health Service, American Industrial Hygiene Association, International Association of Government Labor Officials, Radiological Society of North America, American College of Radiology, U.S. Atomic Energy Commission, American Radium Society, Health Physics Society, American Medical Association, U.S. Air Force, Atomic Industrial Forum, U.S. Army, American Dental Association, American Roentgen Ray Society, National Electrical Manufacturing Association, National Bureau of Standards, and the U.S. Navy.

A survey of the experience and background of the members of the NCRP and of its subcommittees discloses a very impressive cross section of the Nation's knowledge and experience in the field of radiation protection. Further, the committee works closely with leaders in this field in foreign countries both through the International Commission on Radiological Protection and by personal contact. These factors provide an unmatched opportunity for a consensus of informed opinion on questions of radiation protection, with the result that these organizations are universally acknowledged as the most authoritative organizations dealing with problems of radiation protection. Their recommendations on basic standards of radiation protection for occupational workers are accepted internationally both by national groups and by such international groups as the World Health Organization, the International Labor Office, and the International Standards Organization.

There appears to be no question that the recommendations of the NCRP and the ICRP represent the most authoritative guides now available for the protection of workers in industry. There is also no question that these recommendations are and should be subject to change not only as better definitions of the biological risks from exposure to radiation is achieved, but also to reflect developments in such factors as technical ability to control radiation risks, potential contributions of nuclear energy to the common welfare, and general standards of occupational risk.

The basic recommendations of the NCRP and the ICRP are those dealing with actual exposure of the whole body or of major organs of the body to radiation. Related to these are derived standards which deal with concentrations of specific radioactive materials in air and water. These derived standards are estimated to be sufficiently low in that they would not during a lifetime result in exposures of the body or major organs of the body to levels of radiation in excess of those recommended in the basic standards. These secondary standards are subject not only to the uncertainties which may be involved in the basic standards for exposure but in addition to any uncertainties as to the retention and distribution of the individual radioactive materials in the body, and as to the relative importance of nonuniformities in such distribution.

To provide assistance in meeting these basic and secondary standards, and to make it more probable that these standards will be met, the NCRP also makes many recommendations concerning such subjects as measurements of exposure to radiation and of levels of radiation or of radioactivity, good radiation safety practices, and administrative controls. The details of such

recommendations should not be considered mandatory; in fact, under some circumstances there may be methods of accomplishing the same results which are as good or even better than those specifically recommended by the NCRP. There are other areas in which it is as yet impossible to formulate a single set of detailed recommendations that will be applicable under the diversity of conditions to be found in practice. The important consideration is that in any operation the overall operating procedures shall be controlled to conform as closely as possible with the basic standards of radiation protection.

It is quite likely that firmer scientific bases for fundamental standards of radiation protection will come from laboratory research which contributes to a better understanding of the mechanisms of induction of such diseases as leukemia and cancer rather than from applied research planned to obtain quantitative answers to specific questions. The problems of determining, for example, whether or not there is a threshold for the production of leukemia and of cancer by radiation and of how the incidence of either of these diseases depends upon radiation doses at very low rates of exposure is similar to—and may be identical with—that of discovering how these diseases are produced. Medical science has made encouraging progress over the past several decades in gaining an understanding of the fundamental mechanisms involved, but the many competent scientists engaged in this field of research have so far been unable to give us answers adequate to our needs.

On the other hand, the development of secondary standards depends very largely on obtaining specific quantitative data on the biochemical and physical characteristics of individual radioisotopes in relation to their retention and distribution in the various organs or tissues of the body. Thus, research designed to reduce the uncertainties involved in our standards of radiation protection should strike a balance between the effort expended to obtain answers to specific questions and that for increasing our fundamental knowledge of mechanisms involved in producing the biological effects of radiation.

Before leaving this phase of the discussion it should be observed that few if any of the industrial toxins have been subject to such a relentless scrutiny for possible small effects of low concentration on average life span, for the ability to produce small statistical increases in cancer or leukemia, etc., as has ionizing radiation.

LIMITS FOR POPULATION GROUPS

The determination of appropriate limits for the control of exposures of population groups to radiation is more difficult than for the control of occupational exposures for several reasons. Up to the present time, this problem has been met by using for environmental limits a small fraction of occupational limits.

The fraction one-tenth, used for this purpose by the Atomic Energy Commission since 1951, was recommended by the ICRP in 1954 and by the NCRP in 1955. In their most recent reports, both the NCRP and the ICRP recommend that exposures to population groups in the neighborhood of atomic energy installations be limited to one-tenth of occupational values.

In addition, the ICRP recommends fractions applicable to the total population. For exposures of genetic significance, the recommended fraction is one-hundredth and for other exposures one-thirtieth. Except for the recommendation that the average genetic exposure to the total population from all sources should not exceed a total of 14 rem per generation of 30 years, the NCRP has made no recommendations applicable to the total population.

(Whereupon, the committee recessed at 12:30 p.m., to reconvene at 2 p.m. the same day.)

AFTERNOON SESSION

Chairman ANDERSON. The committee will be in order.

I understand that the first witness this afternoon is Dr. Joseph Lieberman.

Mr. GRAHAM. Yes, sir; we have him here. With your permission we will start him right away.

Chairman ANDERSON. You may proceed.

STATEMENT OF DR. J. A. LIEBERMAN, CHIEF, ENVIRONMENTAL AND SANITARY ENGINEERING BRANCH, DIVISION OF REACTOR DEVELOPMENT, AEC

Dr. LIEBERMAN. As Commissioner Graham said, I propose to skip over parts of my statement and concentrate on the topics of the disposal into the ocean, the burial of wastes on land, and our working relationships with other agencies of the States.

Chairman ANDERSON. We will carry the statement in full.

Dr. LIEBERMAN. Management and disposal of radioactive wastes is a general problem whose thread runs through the entire fabric of all nuclear energy operations. Waste materials in either gaseous, liquid, or solid form are evolved in essentially all operations associated with nuclear energy facilities beginning with the mining and milling of uranium ore, through the production of feed materials, isotope use, reactor operations, and chemical reprocessing of irradiated reactor fuels.

Because of the nature and characteristics of the radioactive materials involved, their ability to cause damage to human tissue, their nondetectability by the human senses, and their potential danger as an environmental contaminant, the safe handling and final disposal of nuclear energy wastes are integral and important aspects of these operations. This importance is attested to by the efforts expended in this area in the atomic energy program to date. As was brought out in the waste disposal hearings before this committee earlier this year, plant investment for radioactive waste handling and disposal in the AEC is on the order of $200 million. Annual operating costs for waste disposal are about $6 million. It is believed fair to state that more money probably has been spent and more scientific and technological effort concentrated on facilities, operations, and research and development with regard to nuclear industry wastes than on any other industrial contaminant we have known. The extent and nature of this effort were covered in detail in the waste disposal hearings previously mentioned.

One point that must be strongly emphasized in any discussion of this subject is that, from an engineering and environmental standpoint particularly, the disposal of radioactive wastes cannot be considered as a single problem with a single, best solution. The great variation in the characteristics of the waste products from various processes and operations, including radioactive half-life, concentration, and chemical state, physical characteristics, actual quantities of radioactive materials involved, and the specific location of the nuclear activity are all important in assessing the significance of the potential hazard and in establishing specific engineering design and operational criteria for their safe handling and disposal.

The three major components of waste management are as follows:

(1) Determination of the extent to which specific isotopes may be permitted to reach man.

This includes immediately the concept of concentrations of various isotopes in air and water, the ecological implications of biologic concentration of radioactivity by various organisms in our food chain, and other highly important, complex and, in some instances, unknown biological considerations. From an engineering standpoint the idea

of some quantitative standard of permissible or acceptable concentration of radioactivity in air and water is obviously important.

(2) The specific nature of the radioactive waste under consideration.

This is a highly variable component and, in order for proper consideration to be given to it, it must be approached in specific, quantitative terms. It must be completely understood that there is little basis for comparison of waste management techniques or problems associated with the liquid wastes emanating from a normally operating water-cooled reactor, for example, and those associated with, let us say, the aqueous reprocessing of enriched uranium-aluminum alloy fuels.

(3) The physical, chemical, and biological characteristics of the environment in which the waste is to be considered or handled.

Required here, again in specific, quantitative terms—to the maximum extent possible—is knowledge or data of the atmosphere, the hydrosphere, and the lithosphere, relating to dilution and/or concentration of radioactivity in the environment.

Essentially, then, proper waste management consists of so identifying and quantitatively describing items 2 and 3 and their combined behavior so as to assure conformance to the standards established in item 1.

The two fundamental waste disposal concepts that are applicable to the overall waste problem are characterized by the phrases "concentrate and contain" and "dilute and disperse." The dilute-and-disperse approach is applicable to wastes that normally contain small concentrations of radioactive materials, or in which the concentration can be reduced to small quantities by treatment; and to environments with adequate dilution capacity. The term "dispersal" is used here to describe the discharge of wastes to the environment in a manner that permits little or no direct control by man over the fate of the wastes following their discharge. The discharge of liquid wastes to surface waterways or gaseous wastes to the atmosphere are examples of dispersal.

The concentrate-and-contain technique must be utilized for wastes—the so-called high-level wastes—that contain more radioactive materials than can be assimilated safely by the environment. Systems for final disposal of these wastes must be such that they (*a*) permit continuing, long-term control by man over the wastes, and/or (*b*) assure the wastes will be contained essentially at the point of disposal so that man, his environment, and his resources are not adversely affected. The time element involved is literally hundreds of years.

One of the more significant features of the waste disposal problem in its broad sense is the requirement for focusing the competence of many scientific and technical disciplines on the problem. Since considerations involved in waste disposal cut across all activities and operations related to the utilization of nuclear energy, it becomes evident that the chemical, sanitary, and nuclear engineer; the geologist, hydrologist, and meteorologist; the biologist, chemist, and physicist; and still others have interests and concern with various aspects of the problem. This was clearly recognized in the early stages of AEC operations and accounts for the close and continuing day-to-day working relationships with other specialized Federal agencies and

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State and interstate groups having particular competencies and interests related to the control of effluents.

Waste disposal operations can be categorized according to the characteristics of the wastes under consideration and the way in which they are handled. The particular environment involved is also pertinent to such categorization.

The great majority of wastes of all types that are being handled are from AEC operations. For example, at one AEC installation, Hanford, some 52 million gallons of highly radioactive wastes resulting from chemical processing of irradiated fuel are in storage. This waste contains many millions of curies of radioactive materials. In addition, at Hanford, almost 4 billion gallons of intermediate level wastes have been discharged to the ground through special crib structures. Involved in this disposal were some 2.5 million curies of radioactive materials.

On the other hand, the total radioactivity of isotopes shipped from Oak Ridge from August 1946 to November 1958 was 437,000 curies, of which 98 percent, or some 429,000 curies were fabricated into sealed sources such as cobalt 60, which are generally not subject to waste disposal. In other words, only about 8,000 curies have been shipped as nonsealed source material primarily for medical use. Most of this material was iodine 131 with an 8-day half life. It is obvious that the only common denominator of the waste problems associated with these two different situations is the word "radioactivity."

Generally speaking, essentially all of the wastes evolved from various phases of the reactor fuel cycle and isotope use, with the major exception of the irradiated fuel reprocessing phase, are of the low-level variety. That is, in the liquid form, for example, they generally have concentrations of radioactive material on the order of a small fraction of a microcurie per gallon; i.e., are amenable to the dilute-and-disperse approach to disposal. In certain cases and environments prior treatment may be required. From an operational standpoint low-level wastes are disposed by discharge into streams, into the oceans, into pits or seepage basins, into sewerage systems, and by burial on land.

Because of the variability of the nature of wastes and the environments in which they must be considered, it is not practical to establish detailed, quantitative waste disposal system specifications that are generally applicable. Where any significant quantities of wastes are involved, individual, case-by-case analysis and evaluation are essential. This philosophy is reflected in the AEC regulations in this area. They establish standards of allowable concentrations in effluents to unrestricted areas and provide for the routine disposal of small quantities of nuisance wastes by release into sewerage systems and by burial in the ground. Provisions for consideration of alternate systems involving higher levels of radioactive discharge are made on an individual case evaluation basis. In any case, the same basic standards of radiation protection—i.e., maximum allowable concentrations of radioactive materials in air and water—apply.

Examples noting the status of several waste disposal operations and systems are briefly described below.

URANIUM MILLING WASTES

Although individual spot mill effluent samples and stream samples below several mills indicate that the concentrations of radioactive materials in excess of maximum allowable (primarily radium) are being discharged, not enough analytical results are yet available to permit a rational assessment of existing or potential environmental (stream) contamination problems. In cooperation with the Robert A. Taft Sanitary Engineering Center of the U.S. Public Health Service an industrial waste investigation was initiated last year on the Colorado Plateau. This problem has been discussed extensively with the State agencies involved. We hope that by the end of this summer sufficient quantitative data will be available to enable a critical evaluation of these industrial effluents and their effects on receiving streams. Control samples upstream from several miles were obtained during the course of this field study to serve as a basis for comparison and evaluation.

POWER REACTOR WASTES—SHIPPINGPORT

Loose terminology and erroneous popular notions have both contributed to the association of highly radioactive fission product wastes with normally operating reactors themselves. Although the fission products are formed in the reactor they do not become a waste component until the fuel is removed from the reactor and reprocessed at a chemical processing plant, of which at this time there are only three—at Hanford, Idaho, and Savannah River. The error of such association of high level wastes with the reactor is strikingly shown by the results of the first year's operation of the PWR. Under terms of an agreement with Pennsylvania it was concluded that it would be safe to continuously discharge radioactive materials at the rate of 0.05 curies of mixed isotopes and 300 curies of tritium per month. However, during the first year, a total of about 0.04 curies of mixed isotopes and about 50 curies of tritium were disposed into the Ohio River.

HIGH LEVEL CHEMICAL REPROCESSING PLANT WASTES

It is believed sufficient for the purposes of this testimony to simply note that at the present time, and at least for the immediate future, these wastes are evolved only at the reprocessing sites previously noted. They are not being disposed, but are stored in specially designed underground tanks. The technical and administrative problems involved in their long term or final disposal are formidable, but not insoluble. It appears rather certain that these wastes must be handled under the "concentrate and contain" concept. The periods of time involved are, as noted previously, measured in terms of hundreds of years.

OCEAN DISPOSAL

The radioactive material involved in sea disposal off the Pacific and Atlantic coasts is of a relatively low or intermediate level compared with highly radioactive wastes produced at AEC production sites such as Hanford or the National Reactor Testing Station. The wastes disposed at sea contain quantities of radioactivity normally associated with laboratory operations rather than production or

chemical reprocessing operations. For example, in terms of radioactivity concentration of liquid wastes, which are solidified prior to disposal at sea, are generally in the thousandth or millionth of a curie per gallon range, whereas the liquid high level waste resulting from chemical processing operations at Idaho might have concentrations in the hundreds or thousands of curies per gallon. Thus, there is a factor of difference in concentration of the order of tens or hundreds of millions.

The largest part of the wastes disposed at sea is quite heterogeneous in nature and generally consists of trashy solid materials such as blotting paper, rags used for cleaning up around the labs, broken test tubes, beakers, bottles, and other glassware that were used to contain radioactive solutions, animal carcasses that were used in tracer or other biological experiments and other contaminated laboratory equipment such as duct work and air filters.

Although experience in England has demonstrated the safety and practicality of disposal of bulk liquids at sea, all radioactive wastes disposed by the AEC off both the Pacific and Atlantic coasts of the United States have been in the solid, packaged form. Most of the waste has been contained in 18 gage, 55 gallon drums with concrete liners and concrete tops and bottoms for weighting and shielding purposes. Where bulky pieces are to be disposed, concrete boxes up to about 300 cubic feet in size have been fabricated. The average radioactivity content is about 2 to 10 millicuries per drum for the solid wastes and 3 to 17 curies per drum for the solidified liquid wastes at the time of disposal.

The concrete boxes contain about 2 to 10 curies each, with several containing as much as 500 curies. The total quantity of radioactivity disposed in the area off the Farallones (out of San Francisco) since 1946 was between 10,000 to 15,000 curies at the time of disposal. About 100 curies have been disposed in the Santa Cruz Basin. Approximately 6,000 curies have been disposed off the Atlantic coast. Essentially all of this radioactivity has originated in AEC installations.

I would guess perhaps of the order of magnitude of 100 curies have come from isotope users outside of the AEC installations.

Chairman ANDERSON. So it is 60 to 1, then, you would say?

Dr. LIEBERMAN. Yes, sir. On the Atlantic coast. Then there are the 10,000 to 15,000 curies disposed off the Pacific coast. 100 curies would be the total, sir, from non-AEC users.

The major objectives of the criteria for sea disposal operations are to assure adequate packaging for safe handling between the site of the waste originator and the final disposal and to assure the sinking of the packages in the sea. For example, the package must be able to withstand handling operations during loading and unloading procedures without exposing the contents. A minimum of 10 pounds per gallon of displacement volume is required to assure sinking. Packages also must be properly labeled. If materials are shipped by common carrier, conformance with Interstate Commerce Commission and Coast Guard regulations is required.

Protection of the public health and safety is the overriding consideration in the management and administration of all atomic energy operations, including the disposal of radioactive wastes at sea. It is

believed that these sea disposal operations are being carried out in a manner that is safe and adequate. This belief is based upon: (1) views of experts in the marine sciences and other pertinent fields outside AEC, (2) the actual operating experience of the British in disposing of greater quantities of radioactive material in a less desirable (liquid) state; and (3) the preliminary, but direct information obtained in the Pacific and Atlantic Oceans.

Chairman ANDERSON. Could you stop there and comment on the proposal to license a Houston, Tex., firm to dispose of waste? Senator Yarborough raised some questions about this. He is not a member of the committee and not here, and I thought for his benefit and for ours, we might ask if you know anything about that problem.

Dr. LIEBERMAN. Yes, sir. We did have the privilege of speaking with Senator Yarborough yesterday afternoon, and giving what information we could on the general subject of sea disposal. This situation involves an application for a license for commercial disposal. I won't go into the administrative aspects. Let me say first, Senator Anderson, that the quantity of radioactivity involved is exceedingly small. The disposal area is, as I recall, something like 150 miles off the coast in an area that I believe is presently designated as a disposal area for defective ammunition. We, as part of our development activities, went to a number of experts, primarily in the National Academy of Sciences Committee on Oceanography. This particular situation has been reviewed by them in connection with other work that we are doing with the Academy that I would like to refer to on the establishment of designated sea disposal areas along the Atlantic and gulf coast.

My own conclusion is that the proposed operation in the gulf coast can be carried out with safety. I would be glad to answer any specific questions with regard to the technical aspects of that situation, but these are at least my general conclusions.

Chairman ANDERSON. I could not ask questions about the technical aspects, but what types of waste are you contemplating down there?

Dr. LIEBERMAN. These are primarily from isotope users, the sort of wastes that would accumulate, say, in a university or hospital that is using radio isotopes for various research projects—from anybody that is using radioactive materials, radioactive isotopes that they get from Oak Ridge for various research purposes. It would be those kinds of wastes—contaminated trash.

Chairman ANDERSON. How many curies would you imagine might be involved in this?

Dr. LIEBERMAN. As I recall the license has a possession limit, and I think some people from the Licensing Division can check me on this, of 10 curies of radioactive materials.

Chairman ANDERSON. Does that compare, for example, in your statement where you mention something about the discharge of radioactive material through the 3-mile pipeline in the Irish Sea at the rate of a thousand curies per month? What would be the rate discharged in the gulf?

Dr. LIEBERMAN. Many orders of magnitude less than this.

Chairman ANDERSON. Much less?

Dr. LIEBERMAN. Yes, sir.

Chairman ANDERSON. Would other conditions be approximately the same? Would there be the same amount of safety connected with this? It would seem to me that if the magnitude of the disposal was many, many times less, and the conditions under which it was being disposed of gave the same relative safety, would that indicate that what is being contemplated at Houston is far safer than what is being dumped in the Irish Sea?

Dr. LIEBERMAN. The short answer to that is "Yes, I think it would be far safer." This perhaps leaves the implication that what is being done in the Irish Sea is unsafe and I certainly don't want to leave that impression.

Chairman ANDERSON. Not at all.

Dr. LIEBERMAN. Based on the much smaller quantity of radioactivity, the distance from the coastline and the general oceanographic conditions, I think this certainly represents a much, much smaller potential risk than what is being done in the Irish Sea.

Chairman ANDERSON. Thank you.

Dr. LIEBERMAN. To further delineate the basis for our belief we would cite only briefly the recent consideration and analysis of a subcommittee established at AEC request by the NAS-NRC Committee on Oceanography. They were requested to evaluate the feasibility of establishing a number of sea disposal areas along the Atlantic and gulf coasts for wastes of the type previously described. They have prepared a report (which is now in press) and have suggested the possibility of some 20 inshore locations along the Atlantic and gulf coasts as disposal areas for such wastes. A similar analysis and evaluation is now underway for the Pacific coast.

Mr. TOLL. By inshore locations, do you mean nonocean locations, or do you mean bays and harbors, rivers, and so forth?

Dr. LIEBERMAN. Inshore would be not off the Continental Shelf. It might be in depths as shallow as a few tens or a few hundreds of fathoms, rather than a thousand fathoms. It might be distances from the coastlines of tens of miles rather than hundreds of miles.

Mr. TOLL. The word seemed a little misleading to me. It is in the ocean. It is just not beyond the Continental Shelf.

Dr. LIEBERMAN. That is right. Whether the oceanographers use this term "inshore" to mean it is not off the Continental Shelf, I am not sure, but that is what I mean. The numbers I gave you characterize the locations that have been suggested.

Mr. TOLL. Do you have any information on whether the Gulf of Mexico has currents which are much more turbulent than off the Atlantic Ocean, for example?

Dr. LIEBERMAN. Certainly there is oceanographic information available in the gulf coast and the Atlantic coast. Whether the gulf is more or less turbulent at these specific locations than a particular location on the Atlantic coast, I am not in a position to say. They do have inshore currents and they have long-shore current and these interact. As I recall my discussions with some of the oceanographers concerning the particular circulation in the gulf coast, these inshore currents would react with these along-shore currents, and the material, if it was carried by currents toward the shore, as part of the circulation, would then go seaward at lower depths before it would reach the shore. I would hesitate to go into any great detail on the

detailed circulation but certainly this kind of circulation was considered in detail by the National Academy of Sciences committee when they came up with recommendations for these locations.

Mr. TOLL. Would it be possible for a good oceanographer to identify certain areas where there are comparatively still deep waters?

Dr. LIEBERMAN. Yes, if still deep waters were the things you were looking for, and they may not be. Perhaps one could approach this thing in two ways. If you had still, deep water, perhaps this would be an area where radioactivity could be accumulated, with the low levels of radioactivity we are talking about maybe the thing that should be done is to see that these things are adequately dispersed so that excessive concentrations won't be built up. Therefore, you might want areas in which there are currents. But in any case, the circulatory characteristics of the body of water in which you propose to dispose these materials is obviously an important consideration. I would not want to leave the implication that the oceanographers know all that they want to know about the circulation, but certainly enough is known so that the National Academy of Sciences committee felt that they could do a rational job of making these recommendations.

Mr. LOWENSTEIN. If I could be pardoned for the interruption, Dr. Lieberman referred inadvertently to a license for disposal in the Gulf of Mexico. That is a proposed license. Whether or not the activity may be carried out is presently before the Commission.

Chairman ANDERSON. We are just trying to get the information. We are not holding you to whether it is a proposed license, a license, a hopeful license. Thank you very much. I appreciate your correction. Mr. Ramey?

Mr. RAMEY. Following along the line of your license aspect, could you give us a thumbnail sketch of the regulatory situation on ocean disposal? It is probably in your lawyer's bailiwick more than yours.

Dr. LIEBERMAN. I could say a little bit about it, Mr. Ramey. Whether this is all you want to hear, you will soon be able to tell me. I think it has already been indicated that this involves an application for a license, and public notice is given of the application, and then there are hearing procedures.

Mr. RAMEY. The Commission has jurisdiction from a regulatory standpoint over the ocean disposal?

Dr. LIEBERMAN. That is correct.

Mr. RAMEY. And they have established regulations governing this?

Dr. LIEBERMAN. That is correct.

Mr. RAMEY. And this proceeding we are talking about in Houston is pursuant to those regulations?

Mr. LOWENSTEIN. Yes, sir. May I add that under the Commission's regulations no one may dispose of radioactive material in the ocean without a license which specifically authorizes it.

Chairman ANDERSON. Could you help me out a little bit? I was a member of the committee that wrestled with the tideland oils and the Continental Shelf, and various other things. What sort of jurisdiction do you have outside of the 3-mile limit?

Mr. LOWENSTEIN. I am not sure what the jurisdiction of the United States is with respect to areas offshore, but we do have jurisdiction over the activities of our licensees.

Chairman ANDERSON. Once they get into international waters?

Mr. LOWENSTEIN. They pick up these materials within the United States, and they transport them and possess them within the United States. For the activities that are involved, under our regulations and under the statute, a license and appropriate approval from the Commission are necessary for the ocean disposal.

Chairman ANDERSON. If these were going out perhaps beyond the Continental Shelf, you would grant you would have no control once they get beyond the 3-mile limit?

Mr. LOWENSTEIN. If they violate the conditions of the license, which is a condition for their receipt of the material, we think we do have jurisdiction over those activities, and they are bound by the regulations.

Chairman ANDERSON. If I agree to drive an automobile on the right side of the street in this country and go over to England, you don't have any control over me if I put it on the other side of the street.

Mr. LOWENSTEIN. No.

Chairman ANDERSON. How do you control these people beyond the 3-mile limit? The United States has jurisdiction over the area within the 3 miles. You have other countries with 25 miles and 50 miles, but this country has held religiously to the 3-mile limit. Would it be fair to say that the only control you have is to see that the licensee loads what he agrees to load, and in the fashion he agrees to load it, and goes beyond the 3-mile limit with it?

Mr. LOWENSTEIN. Sir, when they receive material under a license which has a condition attached designating an approved disposal area, even though that disposal area might be outside the territorial limits of the United States, they are bound by those conditions of the license.

Chairman ANDERSON. Therefore, it is their agreement to be bound by it, but not your authority to control?

Mr. LOWENSTEIN. Under the law, sir. We have not made contracts with these people to designate the areas in which they contractually agree to dispose of the material. They receive the material under a statute and under a license, and we believe a violation of the conditions of the license is a violation of the law if they dump material in a place where they have agreed by accepting the license not to dispose of it.

Mr. RAMEY. Is this a contractual violation?

Mr. LOWENSTEIN. No, sir. I should not have used the word "agreed." This is a condition of the license and a condition under which they receive the material.

Representative ASPINALL. What would you do if they did not dump it in the right place?

Mr. LOWENSTEIN. We have remedies which are available to us under the statute. Each of these licensees is required to notify us before he makes a trip away from the shore to dispose of material. There is fairly frequent inspection. The ship's logs are checked. Personnel are interviewed. Let me add, there have been very few of these disposals to date, although there are a number of licenses which are in effect. If we did pick up a violation, we believe that the remedies available under the Atomic Energy Act—license revocation, injunction, criminal proceedings—would all be available in these cases. There may be some disagreement.

Chairman ANDERSON. If he left and did not go to the spot he said he was going to, are you going to patrol each one of these and follow them out to see that they get to the right spot in the gulf? It is purely a matter of good conscience on their part. These are not self-enforcing matters?

Mr. LOWENSTEIN. No, sir.

Chairman ANDERSON. I do not believe you will have any trouble with it, but if you did, I wonder if you had any right to assert jurisdiction beyond the 3-mile limit.

Mr. LOWENSTEIN. The question is a complicated legal question, Senator.

Chairman ANDERSON. You recognize that a short time ago certain gambling ships were outside the 3-mile limit but had a license of some kind from the U.S. Government. They were there. They paid their tax, but they went outside the 3-mile limit and indulged in various things. I wonder if this is not solely a field in which you have to have good faith relationship with the licensee and very little other than that to enforce it?

Mr. LOWENSTEIN. I think the element of good faith is important. We think we have legal authority, too.

Mr. RAMEY. Would your Inspection Division make a spot check of a kind?

Mr. LOWENSTEIN. As I mentioned, I think there have been only one or two licensed disposals to date, but I am confident the Inspection Division is prepared to take some reasonable steps to satisfy itself that these are being carried out properly. Mr. Curt Nelson is here and will be available to answer any questions on that later.

Chairman ANDERSON. You may proceed.

Dr. LIEBERMAN. Still on the subject of sea disposal, Mr. Chairman, mention must be made also of the British experience in disposing of bulk liquid wastes into the Irish Sea. As a result of detailed investigation by British atomic energy facilities and public health authorities, the British Government concluded that it would be safe to discharge radioactive materials directly through a 3-mile pipeline into the Irish Sea at the rate of 1,000 curies per month. As a result of actual monitoring studies during a period of discharge at that rate, it was determined that the discharge rate could be increased safely to 10,000 curies per month. Reports of this work have been published. I believe they are being included in the record of the waste disposal hearings.

LAND BURIAL

Burial grounds for disposal of solid or packaged waste materials originating at AEC facilities are established at Oak Ridge, Hanford, Savannah River, Idaho, and Los Alamos. In addition, land burial service for licensees has been provided by the Oak Ridge National Laboratory and the Oak Ridge Operations Office on an accommodation basis under a charge of a fixed fee per package. However, increasing solid waste volumes and repeated requests for land burial service have become an increasing operational and administrative burden to Oak Ridge National Laboratory during the past 2 years. This condition has been caused primarily by the rapid expansion of nuclear energy uses in the northeastern area of the United States.

Approximately one-half of all isotope shipments in the United States are made to the region encompassing Massachusetts, Connecticut, Rhode Island, Maine, New Hampshire, New York, New Jersey, Delaware, Pennsylvania, Maryland, Ohio, Indiana, Illinois, Michigan, and Wisconsin.

Chairman ANDERSON. On page 8 you talk about these 18-gage 55-gallon drums. Is there a similar system of burial in these States that you are talking about?

Dr. LIEBERMAN. No, sir. There is not a similar system of land burial in these States. The only place that land burial is now being done with solid or packaged radioactive wastes are at the AEC installations which are in relatively isolated and large areas. The ones I mentioned—Oak Ridge, Hanford, Savannah River, Idaho, and Los Alamos—they are the only places at the present time in this country where these low-level wastes are being buried.

Chairman ANDERSON. Senator Yarborough is a little worried that these drums might deteriorate. Is there any danger in that which you see? Is there any danger that the land burial, which is somewhat different, might deteriorate?

Dr. LIEBERMAN. Yes, sir. In the case of sea disposal, it is quite conceivable that the drums will deteriorate. In the analysis of the diffusion of the radioactivity, if the drum did deteriorate, we have assumed a conservative approach and made the assumption that when this package hit the bottom it was as though there were not any package—that all the radioactive materials contained were dispersed. Then it is just the straight diffusion, even in still water; or if there are currents, the dispersion caused by the ocean currents that reduce the concentration of radioactive materials down to safe levels. So, in effect, in our sea disposal operations we are conservative and do not count on the package maintaining its integrity over long periods of time. It has been estimated that the packages that are disposed perhaps have a life of the order of tens of years, which might be less than the radioactive life of the material. But the fact remains—in our analysis of this situation, we operate on the basis that this radioactivity is dispersible and the dispersing effects of the environment are the things that take it down to a level that is safe.

As far as land burial is concerned, it is again conceivable that the packages will not last as long as the effective life of the material. Therefore, the location of these burial grounds has to be especially selected. Again, the ability of nature to either disperse these wastes to a safe level or to hold them up long enough so that they will decay to a safe level is the thing that we count on. In other words, the location of the burial ground would not want to be associated with the source of potable ground water. The nature of the geologic formations and the soils would be such that they would adsorb the radioactivity and not let the radioactive material disperse into the environment in a way or in concentrations that would be harmful.

For example, at Hanford—this is not a burial ground operation—the direct discharge of radioactive wastes into the ground involve extensive monitoring wells around these cribs to make sure that the radioactive materials are not migrating through the ground at a rate that would be dangerous. Certainly, these are considerations in establishing the operating criteria for both sea disposal and land burial.

Mr. RAMEY. Do your regulations cover the disposal of low-level wastes in streams—permitting decay, and then at certain levels be disposed of?

Dr. LIEBERMAN. Again I think the answer to your question is "Yes," Mr. Ramey. If I could elaborate on that for just a moment: There are two separate paragraphs—I cannot recite the paragraph numbers or letters, but one says in effect that you shall not dispose to the stream in concentrations greater than the allowable concentrations in drinking water for the nonoccupational population. However, there is another paragraph that says if you come to us and give us enough information, and in effect demonstrate that there is a dilution capacity in the environment that you want to dispose of these low-level liquid wastes, at a level higher than nonoccupational MPC's, we will consider it. In other words, the regulations do permit the utilization of the environment to disperse certain quantities of radioactive wastes; but the fact has to be demonstrated that the particular environment has that capacity to receive that waste safely.

Mr. RAMEY. Implicit in any kind of a judgment that you make, there has to be some sort of a standard of what is a permissible level of radioactivity in the environment. Have you ever made that standard concrete?

Dr. LIEBERMAN. I would like to distinguish between standards and what we might call performance criteria. The standards are just that. In other words, the allowable concentrations of radioactive materials in the water you drink. Let us say for the sake of discussion we have a stream that is not used for drinking water, or is not used for fisheries, or for which there is no use with regard to the public that is important. Then, a legitimate use, perhaps, is the dilution of radioactive materials. But as a specific example let me cite the Mohawk River, which is one that we have some experience with. The standards have to be met for maximum allowable concentration as to the water supply of the city of Cohoes, which is 13 miles downstream from the Knolls Atomic Power Laboratory. But we found we could discharge concentrations of radioactive materials at the Knolls Laboratory that were in excess of the maximum allowable concentrations in drinking water. Nevertheless, the standards are still being met at the point where the water is being used. So the performance criteria are set up to make sure the drinking water standards at Cohoes are met. I don't know whether this clarifies the matter or whether I got my point across or not. I think it is important in this particular connection to distinguish between standards and performance criteria that are established to make sure those standards are being met.

Mr. RAMEY. I take it your performance criteria are applicable to a particular situation more so than your standards, which are more of an overall sort of thing?

Dr. LIEBERMAN. Precisely. That is precisely the point, Mr. Ramey. Performance criteria are not generally applicable across the board. The performance criteria have to be set up on the basis of the individual case, whereas the standards are applicable across the board.

Mr. RAMEY. In setting up your standards across the board, have you taken into account the NCRP general levels that they adopted?

Dr. LIEBERMAN. Yes. The standards are those that are contained

in part 20 of the AEC Regulations. In other words, we as waste disposers depend on the medical people and biologists in promulgating these standards. They supply the standards to us. We have to met the standards. Then the engineering and environmental conditions are brought in to make sure that in particular situations these standards are met.

Mr. RAMEY. As brought out this morning, all of these determinations are as of now. One of the questions that has been asked is, What about the accumulation, what about a generation from now? In other words, can you go into a large scale atomic power installations using standards as of now?

Dr. LIEBERMAN. Certainly insofar as the standards might be modified in the future, obviously the performance criteria would have to be modified to meet those standards. Just as obviously, if you are putting radioactive materials into the environment, you have to continuously monitor that environment to make sure that at no time is the safe capacity of that environment exceeded. As we go along, and we find that we are getting close to these standards, or we are getting to the point where we have to back down, this obviously must be reflected in a modification of operation and the performance criteria that are in use.

Representative DURHAM. If we back down and nobody else backs down, what good will it do us?

Dr. LIEBERMAN. This is a situation we are confronted with in the management of other industrial wastes. I think that the regulations have to be such that it is not a case of backing down, really; it is a case of requiring that the performance meet the standards that are generally acceptable. There can't be any two ways about that in my estimation.

Chairman ANDERSON. May I just remind you, Mr. Graham, that you have five more people on this list before 3 o'clock. We probably won't hold you to the 3 o'clock. I think you better continue as rapidly as possible.

Mr. GRAHAM. Thank you, Mr. Chairman.

Dr. LIEBERMAN. In addition, over 50 percent of the research and test reactors being planned or built primarily for research purposes are located in this area. Approximately 75 percent of the power reactor projects being planned or constructed are concentrated on this approximate area. These conditions point strongly to the need for the establishment of a regional radioactive waste burial ground in order to provide the most adequate and economical means for packaged solid waste disposal. Technical criteria have been established and preliminary survey work on site selection for such a burial ground has been accomplished at several locations.

There have been discussions as to the possibility of establishing privately owned burial grounds which might be licensed by the Commission for the disposal of radioactive wastes. However, the establishment of such burial grounds does not presently seem to be feasible. No method has been suggested to assure the long term maintenance and supervision of a privately owned burial ground. Because of the type, level of activity and half-life of the radioactive wastes, it may be necessary to maintain land burial areas for extended periods of time, perhaps many hundreds of years.

WASTE DISPOSAL RESEARCH AND DEVELOPMENT

The general but basic objectives of the waste disposal research and development program can be listed as follows:

First, to develop safe, practical systems for the ultimate disposal or long-term management of highly radioactive wastes associated primarily with the chemical reprocessing of irradiated nuclear fuels;

Second, to evaluate quantitatively the dilution and/or concentration factors in nature and in specific environments in order to determine what degree of treatment may be required prior to release of effluents to the atmosphere, ground, or waterways;

Third, to obtain increased knowledge of the fundamental phenomena and processes involved in the handling and disposal of radioactive wastes so that more efficient and economic systems may be devised.

In addition, other less technical, but perhaps equally important purposes, are served by the research and development activities. For example, the program supplies a valuable mechanism for integrating the nationwide efforts of private and governmental agencies in dealing with waste disposal and environmental problems of America industry with the newer and, in some cases, unique operations of the nuclear industry. This allows advantage to be taken of the specialized experience and competency of various experts in these agencies. The program in a number of cases which are noted later has also been the framework for assisting and working with State and local officials concerned with waste disposal and environmental problems in areas of their jurisdiction. This has enabled a better understanding of related problems of the nuclear energy industry in these fields of public responsibility and concern. The cooperative undertakings with other Federal agencies and a number of States have contributed substantially to the development program. Individual development projects are being carried out at AEC laboratories, by several other Federal agencies, by a number of universities and by other private technical, research and development organizations. These activities were also described in considerable detail in the waste disposal hearings. Although the major portion of the development program is directed toward problems of immediate AEC concern, it is believed that the results obtained from the program are useful and applicable to the beneficial utilization of nuclear energy across the board.

In this area of waste disposal and environmental control, and from both an operational and research and development standpoint, very valuable work projects have been initiated by the AEC and are being carried out on a cooperative basis with the following Federal agencies, some for as long as the past 10 to 12 years.

U.S. Geological Survey (Geologic and hydrologic aspects of liquid and solid effluent control).

U.S. Weather Bureau (Meteorologic aspects of gaseous effluent control).

U.S. Public Health Service Studies on fate of radioactivity in specific environments).

U.S. Coast and Geodetic Survey (Studies of marine environments—New York harbor, ocean disposal areas).

U.S. Maritime Administration (New York harbor studies).

U.S. Army Chemical Corps (Air filter evaluation).

U.S. Bureau of Mines (Incineration of combustible wastes, direct disposal in salt formations and deep wells).

These arrangements, wherein AEC funds are used to support specific operational and research and development projects of mutual interest also have included assignment of Agency personnel to AEC installations for training and direct assistance. As examples, USGS personnel have been or are assigned either on a full- or part-time basis to NRTS, Oak Ridge, BNL, Hanford, Savannah River, Los Alamos, KAPL, Washington and other AEC installations. A similar situation exists with the USWB and the USPHS. In the case of the USPHS arrangements were made for the training of personnel at AEC development projects being carried out at several universities.

The attached bibliography of special reports to the AEC by some of the other Federal agencies gives further indication of the nature and scope of these working relationships.

To further strengthen our attack on waste disposal problems, the AEC also initiated formal working relationships with specialized groups of the National Academy of Sciences—National Research Council. For example, the Earth Sciences Division, at the request of AEC, established a Committee on Waste Disposal to assist in connection with problems of disposal of radioactive wastes on land. The NAS-NRC Committee on Oceanography was established at the request of several agencies of which the AEC is one. This group, as previously noted, has given or is in the process of giving, specific assistance (at the request of AEC) in connection with evaluation of possible inshore sea disposal areas for solid or packaged waste materials off the Atlantic, gulf, and Pacific coasts; and establishment of criteria for disposal of wastes from nuclear propelled ships.

In the same way that the advantages of and requirements for close working relationships with other Federal agencies were recognized early in the life of the AEC, was the concept and philosophy of relationships with the various States established in this field of waste disposal. In 1948 relations were established on a semiformal basis when a number of State officials, mainly State sanitary engineers and other State health department representatives, primarily in States in which there were AEC facilities, were "Q" cleared and were informed of those phases of operations of direct interest to their responsibilities within their respective States. These operations had to do mostly with gaseous and liquid effluent control at the various AEC plants. Information was transmitted by direct discussion, through issued reports, and through visits by these State officials to the plants. Although at this time practically all of the information and activities related to waste disposal are unclassified, nevertheless to assure that pertinent information could be discussed in specific situations 12 State sanitary engineers were "Q" cleared.

From the initiation of these contacts with the States and other Federal agencies liaison activities were increased and several more formal relationships were established in the form of special technical advisory groups which specifically included State representatives. This facilitated the transmission of information to the particular States involved in areas of interest and concern to them and also better enabled the AEC to seek advice of these groups in matters related to effluent and environmental control.

These groups involved are:

Columbia River Advisory Group—Washington, Oregon, USPHS.

Mohawk River Advisory Group—New York, city of Schenectady.

Savannah River Advisory Board—South Carolina, Georgia, USPHS, USGS, Corps of Engineers.

Idaho Environmental Advisory Board.

Since, for the most part the major interest—as indicated by the group of titles—is in the area of disposal of liquid wastes to waterways, advantages was also taken of the existence of other interstate groups concerned with stream sanitation and water pollution control in connection with specific AEC projects and operations. Included in this group are:

Ohio River Valley Water Sanitation Commission—Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, West Virginia, Virginia (interstate compact operating under a congressional charter).

New England Interstate Water Pollution Control Commission—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, New York, Vermont.

Interstate Commission on the Potomac River Basin—Maryland, Virginia, District of Columbia, West Virginia, Pennsylvania.

Interstate Commission on the Delaware River Basin—Pennsylvania, New York, Delaware, New Jersey.

Interstate Sanitation Commission—New York, Connecticut, New Jersey.

These relationships continue to the present time. In periodic meetings with these groups information is given regarding waste disposal operations that bear on the groups' functions. In turn, these groups have supplied useful environmental data and advice on numerous occasions in connection with existing or proposed waste operations. It should also be noted that other Federal agencies, particularly the USPHS, participate in the activities of these groups.

Following the passage of the Atomic Energy Act of 1954, and the inception of the AEC's licensing and regulatory program, in addition to the continuance of the activities noted above, there have been numerous occasions where AEC staff has acted in a technical consultative capacity with various States in connection with the environmental aspects of licensed operations within the individual States.

A number of States have directly participated or otherwise cooperated in several AEC waste disposal development projects. Examples include investigation of dilution factors in the Mohawk River in New York, fundamental studies of fate of radioactivity streams in Massachusetts, stream investigations in the Chicago drainage canal in Illinois, waste investigations in the uranium milling industry on the Colorado Plateau, studies of disposal of high level wastes in salt formations in Kansas, studies of injection of certain wastes into the ground at the University of California, possible burial of low level solid or packaged wastes in New York and Pennsylvania and others.

It is strongly believed that the technical relationships established in the field of waste disposal with other Federal agencies and many States has been an important part of our waste management program. We believe that these relationships and cooperative projects have been of mutual advantage and look forward to their continuance and expansion.

Although perhaps not specifically involved in the subject matter of these hearings the international aspects of waste disposal are closely enough related to warrant some mention. Our working relationships and exchange of information with other countries working in this field, particularly England, France, Canada, and Belgium, and with Euratom and the International Atomic Energy Agency are quite active. In recent months we have been particularly active with the IAEA on matters related to the disposal of radioactive wastes at sea and in assisting in the planning of an international conference on the subject of waste disposal scheduled for November of this year. Undoubtedly, as the nuclear energy industry expands our international activities in this area will increase.

That concludes my presentation, Mr. Chairman.

(Appendixes I and II to Dr. Lieberman's statement appear on p. 62.)

Representative ASPINALL. Mr. Chairman, I have one question. It has to do with the part that refers to uranium milling wastes. In the first paragraph it is suggested that individual spot mill effluent samples indicate that concentration of radioactive materials in excess of maximum allowable are being discharged. Not enough analytical results are yet available to permit a rational assessment of existing or potential environment contamination.

Has there been enough study given to this particular matter to be able to state accurately whether or not there is any danger to human life or plant life in those areas?

Dr. LIEBERMAN. Sir, I would say that here is an example where, in cooperation with the U.S. Public Health Service, we believe we are developing the kind of information that is required to answer your question in a definite quantitative way. The fact that individual samples right from the mill effluent may have concentrations in excess of the maximum allowable concentration, or whatever term you want to use for that, I think relates back to the question that Mr. Ramey asked. It might be that the concentration at the outfall is in excess, but because of paricular environment it does not necessarily follow that this is, or does represent a specific pollution problem.

Representative ASPINALL. This kind of statement without any explanation whatsoever might be rather serious in an area such as I represent. At the present time as I understand you, you don't know whether or not there is any danger of any importance or not.

Dr. LIEBERMAN. The Public Health Service in their operations with the States on the Animos River are now preparing a report on that particular location. We requested the Public Health Service to take a broader look at the Colorado Plateau, and to carry out what we would characterize as an industrial waste investigation to develop the sort of information needed to answer your question. They have been in the field and collected various samples, and we hope by the end of this summer we would have this kind of information available.

Representative ASPINALL. Perhaps the Animus River is the one river that should not be studied.

Dr. LIEBERMAN. Perhaps so, but I don't think so.

Chairman ANDERSON. Isn't it more than perhaps so? It is just so that it is not the one you should study if you are going to look for industrial wastes from the Colorado Plateau. What would make you pick the Animus River?

Dr. LIEBERMAN. I think perhaps the Public Health Service can answer this, but this was at the request of the States involved there. They came to the Public Health Service and asked that this particular river be studied.

Representative ASPINALL. For the simple reason that there is a city or small community along that area, but in an area where we have been mining radioactivity since 1910 or 1911, where there is a great deal of waste material at the present time, not only going from the mines, but going from the mills, we don't have any study going on that I know of. Do you know of any?

Dr. LIEBERMAN. Yes, sir. The Public Health Service was in the field last summer getting samples. They are now analyzing places other than the Animus, the Colorado, the Gunnison, and other areas on the plateau. This is a project that is being done cooperatively between the AEC and the Public Health Service.

Representative ASPINALL. I suggest that the Dolores River is perhaps the place you should go.

Dr. LIEBERMAN. I am sorry.

Representative ASPINALL. I suggest that perhaps the Dolores River is the place you should go.

Chairman ANDERSON. In western Colorado. Do you feel you have jurisdiction over the control of industrial waste or is that a problem for the Public Health Service? Millingwise, for example?

Dr. LIEBERMAN. I would like to let the lawyers answer that as far as jurisdiction is concerned, Senator Anderson. I think we do, but I would defer to them.

Mr. LOWENSTEIN. As I understand it, sir, as to the mills that are operating under AEC licenses, their discharge of radioactive wastes from the licensed milling operations are within our jurisdiction.

Chairman ANDERSON. It raises a nice point. Not necessarily. Doesn't the Public Health Service have a little different view?

Mr. LOWENSTEIN. I did not mean to suggest that other agencies did not have an interest in it also. You asked me whether or not we have jurisdiction.

Chairman ANDERSON. I asked you whether the Public Health Service had a litle different view, on whether or not you had jurisdiction or control.

Mr. LOWENSTEIN. I don't know what their view is.

Dr. LIEBERMAN. If I could add this, Senator Anderson, and this is not speaking from the jurisdictional point of view, but certainly as far as the views of the Public Health Service in setting up this cooperative field project, maybe we did not stop to think about who had jurisdiction——

Chairman ANDERSON. That is one of the purposes of the hearing. We are trying to find out about it. In my particular State where we have a few mills, I think we would all agree, would not the State mining inspector, if he felt like it, exercise some jurisdiction?

Dr. LIEBERMAN. I would certainly think so, sir.

Chairman ANDERSON. That is why I asked you if you had jurisdiction. By what law do you have jurisdiction over the milling wastes?

Dr. LIEBERMAN. As far as I know, it is under the Atomic Energy Act of 1954. I would defer to the lawyers.

Chairman ANDERSON. Give us the section.

Mr. LOWENSTEIN. Sir, I wonder if there may be some misunderstanding, perhaps? With respect to mining as such, the Commission has taken the position, I believe, in an earlier hearing, and an opinion was furnished by the general counsel, that the Commission under the Atomic Energy Act of 1954 does not regulate mining.

Chairman ANDERSON. Maybe I can preface my question by saying to you, as you undoubtedly know, some 85 to 90 percent of all the potash mined in the United States is mined in one county in New Mexico. The mining of the potash led to the discharge of salt brine into the river which discharged on some land. Who has the responsibility for the care of those salt brines—the mining inspector, the health department, the agricultural commissioner, if we had one, and so forth and so forth. I assume the same question might arise in connection with the uranium milling. We don't say that the State of New Mexico can sign a contract for the mills to supply their product to the Atomic Energy Commission. No. That is a function of the Atomic Energy Commission. But who has jurisdiction over the waste product of that mill and by what law?

Mr. LOWENSTEIN. The uranium mills are operating under AEC license.

Mr. RAMEY. The mines are not operating under AEC license.

Mr. LOWENSTEIN. The mines are not operating under AEC license, but the mills are.

Mr. RAMEY. But they do have radioactive wastes nevertheless in the mines.

Mr. LOWENSTEIN. The mines do, and they are not regulated by the Commission.

Chairman ANDERSON. Do I understand then that your contention is that as long as something operates under a license from the AEC, all its functions, health, welfare, and everything else, fall to the AEC?

Mr. LOWENSTEIN. No, sir, I did not mean to say that.

Chairman ANDERSON. How far down do you slice it? You gave a license to a mill and you retain jurisdiction over the safety features of that mill?

Mr. LOWENSTEIN. Under our regulations and the license we exercise jurisdiction with respect to the radiation hazards from the licensed activity, be those in plant radiation hazards or radiation hazards from effluent from the mill or other radiation activities associated with the licensed activity.

Chairman ANDERSON. I see the language that the counsel refers to where it says that the Commission is authorized to issue or no person may transfer or receive in interstate commerce, transfer, deliver, or receive possession or title to or import into the United States any source material after removal from its place of deposit in nature, except, and so forth. I don't believe that quite satisfies me. I want to know if you do feel that you have jurisdiction over wastes that come from milling operations when the law of the State has not given that to you. The Federal Government only gets its jurisdiction because the State abandons the field, does it not?

Mr. LOWENSTEIN. Perhaps I could refer to a number of other sections—section 62 and section 161.

Chairman ANDERSON. It is not too important. We will get to it later on. Maybe you better give us a letter on what you base this on, because I think this may be a field that requires State and Federal cooperation.

Mr. LOWENSTEIN. Yes, sir. I am sure that it does.

(The letter referred to follows:)

U.S. ATOMIC ENERGY COMMISSION,
Washington, D.C., June 3, 1959.

Mr. JAMES T. RAMEY,
Executive Director, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR MR. RAMEY: As appears at page 136 of the stenographic transcript of hearings before the Joint Committee on Atomic Energy, Tuesday, May 19, 1959, Senator Anderson requested us to furnish a letter describing the statutory basis for the Commission's regulatory controls over the discharge of effluent by licensed uranium mills into waterways.

The requirement that these mills be licensed is contained in chapter 7 of the Atomic Energy Act of 1954, as amended, and, particularly, in sections 62 and 69.

Section 161 of the act authorizes the Commission to:

"b. established by rule, regulation, or order, such standards and instructions to govern the possession and use of special nuclear materials, source material, and byproduct material as the Commission may deem necessary or desirable to promote the common defense and security or to protect health or to minimize danger to life or property."

Section 161 also authorizes the Commission to:

"i. prescribe such regulations or orders as it may deem necessary (1) to protect restricted data received by any person in connection with any activity authorized pursuant to this act, (2) to guard against the loss or diversion of any special nuclear material acquired by any person pursuant to section 53 or produced by any person in connection with any activity authorized pursuant to this act, and to prevent any use or disposition thereof which the Commission may determine to be inimical to the common defense and security, and (3) to govern any activity authorized pursuant to this act, including standards and restrictions governing the design, location, and operation of facilities used in the conduct of such activity, in order to protect health and to minimize danger to life or property."

Section 183 provides, among other things, that each license issued under the act "shall be in such form and contains such terms and conditions as the Commission may, by rule or regulation, prescribe to effectuate the provisions of this act * * *." Section 186 provides that any license may be revoked for, among other things, "violation of, or failure to observe any of the terms and provisions of this act or of any regulation of the Commission." Chapter 18 includes additional enforcement provisions and penalties for violation of regulatory requirements.

In light of these provisions, we believe that the Commission has authority to impose limits upon licensed operators of uranium mills with respect to the discharge into waterways of radioactive effluent from the licensed activities.

Sincerely yours,

A. R. LUEDECKE,
General Manager.

Chairman ANDERSON. Are there other questions? If not, thank you very much.

Mr. GRAHAM. Mr. Chairman, we have used up all of our time.

Chairman ANDERSON. We will give you a little leeway.

Mr. GRAHAM. Thank you. You have been very gracious in allotting us these 2 hours.

(The appendix material referred to on p. 58 follows:)

APPENDIX I

SELECTED PUBLICATIONS AND RESEARCH PAPERS OF THE U.S. WEATHER BUREAU RELATED TO NUCLEAR ENERGY

A. PUBLICATIONS

1. Eisenbud, M., and Wanta, R. C., "Non-Occupational Berylliosis," AEC, NYOO–53, March 1949.
2. Gifford, F. G., Jr., "An Alignment Chart for Double Theodolite Computations," Mon. Wea. Rev. 80, 1952.
3. ———, "A Study of Low-Level Air Trajectories at Oak Ridge," Mon. Wea. Rev. 81, 1953.
4. ———, "An Alignment Chart for Atmospheric Diffusion Calculations," Bulletin AMS, March 1953.
5. ———, "The Height of Scintillation Producing Disturbances," Bulletin AMS 36, 1955.
6. ———, "Atmospheric Diffusion from Volume Sources," Jour. AMS, June 1955.
7. ———, "A Simultaneous Lagrangian-Eulerian Turbulence Experiment," Mon. Wea. Rev., December 1955.
8. ———, "The Relation Between Space and Time Correlations in the Atmosphere," Jour. AMS 13, 1956.
9. ———, "An Atmospheric Diffusion Nomogram With Extended Parameter Ranges," ORO–149, Oak Ridge, February 1956.
10. ———, "Relative Atmospheric Diffusion of Smoke Puffs," Jour. AMS, October 1957.
11. ———, "Statistical Properties of a Fluctuating Plume Dispersion Model," Atmospheric Pollution Symposium, Oxford, England, August 1958.
12. Griffith, H. L., Panofsky, H. A., and Van der Hoven, I., "Power Spectrum Analysis Over Large Ranges of Frequency," Jour. AMS 13, June 1956.
13. Holland, J. Z., "Time Sections of the Lowest 5000 Feet," Bulletin AMS, January 1952.
14. ———, "A Meteorological Survey of the Oak Ridge Area," ORO–99, Oak Ridge, November 1953.
15. ———, "The Diffusion Problem in Hilly Terrain," Chapter 96 Air Pollution, McGraw-Hill, New York.
16. Humphrey, P. A., and Morgan, D. M., "Procedure for Weighing Fluted Filters With Use of Aluminum-Foil Envelopes," AMA Arch. Indust. Hygiene and Occupational Medicine, May 1953.
17. ———, and Wilkins, E. M., "The Climatology of Stack Gas Diffusion at the NRTS," IDO–10020, Idaho Falls, March 1952.
18. ———, and Wilkins, E. M., "Meteorology of the STR," published in Mark I Feasibility Report WAPD–70, December 1952.
19. ———, and Wilkins, E. M., "Engineering Climatology of the ANP Site, NRTS," IDO–10021, Idaho Falls, April 1953.
20. ———, and Wilkins, E. M., "Diffusion and Engineering Climatology for the Berkeley Radiation Laboratory," U.S.W.B., December 1953.
21. Kleinsasser, T. W., and Wanta, R. C., "The Development of a Forecasting Service for Use in Air Pollution Control," AMA Arch. Indust. Health, October 1956.
22. Machta, L., "Global Scale Dispersion by the Atmosphere," Proc. 2nd U.N. Intern'l Conf. on Peaceful Uses of Atomic Energy, June 1958.
23. McCormick, R. A., "Discussion of Variation of Wind Velocity and Gusts with Height," Proc. ASCE, 79, No. D–126, 1952.
24. ——, "The Partition and Intensity of Eddy Energy at the 91-Meter Level During Unstable Conditions as Observed at Brookhaven National Laboratory," Quart. Jour. Roy. Met. Soc. 80, 1954.
25. Myers, R. F., "A Low-Level Temperature Sounding System for Routine Use," Bulletin AMS, January 1952.
26. ——, and Purdy, D. M., "Dispersion of Airborne Activity and Characteristics of Site," ORNL 1835, Oak Ridge (undated).
27. Pack, D. H., "An Investigation of the Three-Dimensional Wind Structure Near Shippingport, Pennsylvania," U.S.W.B., Washington, D.C., August 1956.

28. ——, "Meteorology and Reactor Accidents," Proc. Nuc. Energy Training Course for Insurance Personnel, March 1958.
29. ——, "Meteorological Data from Surrounding Stations Supplied for Preliminary Estimate of CANEL Climatology," Section D of Nuclear Physics Hazard Report, PWAC 139, Middletown, Connecticut (undated).
30. ——, and Hosler, C. R., "A Meteorological Study of Potential Atmospheric Contamination from Multiple Nuclear Sites," Proc. 2nd U.N. Intern'l Conf. on Peaceful Uses of Atomic Energy, June 1958.
31. ——, Hosler, C. R., and Harris, T. B., "A Meteorological Survey of the PWR Site at Shippingport, Pennsylvania," U.S.W.B., Washington, D.C., December 1957.
32. ——, Hosler, C. R., and Wilkins, E. M., "Meteorological Analysis Applicable to Operation of a Nuclear Powered Vessel," U.S.W.B., Washington, D.C., 1957.
33. Panofsky, H. A., and McCormick, R. A., "The Vertical Momentum Flux at Brookhaven at 109 Meters," Geoph. Res. Paper No. 19, 1952.
34. ——, and McCormick, R. A., "Property of Spectra of Atmospheric Turbulence at 100 Meters," Quart. Jour. Roy. Met. Soc. 80, 1954.
35. ——, and Van der Hoven, I., "Spectra and Cross-Spectra of Velocity Components in the Mesometeorological Range," Quart. Jour. Roy. Met. Soc. 81, October 1955.
36. Van der Hoven, I., "Power Spectrum of Horizontal Wind Speed in the Frequency Range from 0.0007 to 900 Cycles Per Hour," Jour. AMS, April 1957.
37. U.S. Weather Bureau, Idaho Falls, Idaho, "A Brief Discussion of the Meteorological Program at the NRTS," IDO–20001, September 1952.
38. ——, "Environmental Aspects of the Materials Testing Reactor Operation," IDO–10016, December 1952.
39. ——, "Tower Observations of Atmospheric Dust," September 1953.
40. ——, "A Meteorological Survey of the CANEL Site, Summer 1956," Bowne, N. E., 1956.
41. ——, "A Meteorological Survey of the CANEL Site, Autumn-Winter, 1956–57," Bowne, N. E., 1957.
42. ——, "Meteorological Aspects of IET Operations" (undated).
43. U.S. Weather Bureau, Oak Ridge, Tennessee, "A Thermistor Temperature Recorder for Meteorological Survey," ORNL–556, May 1950.
44. U.S. Weather Bureau, Washington, D.C., "Meteorology and Atomic Energy," AECU–3066, July 1955.
45. ——, "Meteorological Aspects of Air Cleaning," September 1953.
46. White, F. D., and Pack, D. H., "Meteorology as Related to Reactor Site Selection," *Amer. Soc. of Civ. Eng.*, July 1955.
47. Wilkins, E. M., "Effect of Topography on Winds and Diffusion Conditions at the NRTS," *Jour. APCA*, May 1956.
48. ——, "A Discontinuity Surface Produced by Topographic Winds Over the Upper Snake River Plains," *Bulletin AMS* (undated).

B. RESEARCH PAPERS

1. "Climatological and Atmospheric Diffusion Study for Dayton, Ohio," June 21, 1948.
2. "Wind Roses for Stations in the Oak Ridge Area," October 12, 1948.
3. "Climatological Report for Fort Peck, Montana; Pierre, South Dakota, and Wilmington, North Carolina," November 29, 1948.
4. "Climatological Report for North Platte, Nebraska; La Junta, Colorado; and Klamath Falls, Oregon; Supplement 1," December 23, 1948.
5. "Recommended Meteorological Requirements of the AEC Nuclear Reactor Test Site, ARCO, Idaho," September 16, 1949.
6. "Preliminary Climatological Report for Site 5 (South Carolina) and Site 129 (Illinois)," October 20, 1950.
7. "The Fumigation Index," November 27, 1950.
8. "Meteorological Aspects ofthe Knolls Atomic Power Laboratory Site," 1951.
9. "The Critical Richardson Number in an Elevated Layer Near Sunrise," Wanta, R. C. (undated).
10. "Some Measurements of Vertical Diffusion in the Free Atmosphere," January 1951.
11. "Formulae for Estimating Concentrations and Exposures From Radioactive Stack Gases," January 28, 1951.

12. "Effects of Meteorological Elements on Radium Emanation From the Soil,"
13. "Meteorological Effects on Dispersion of ARE Airborne Waste," June 5, 1951 (also ORNL 1407).
14. "Winds in the Vicinity of X–10 Correlated With Thermal Stability and Precipitation" (undated).
15. "Meteorological Estimates for Rocky Flats Plant of the AEC," July 27, 1951.
16. "Meteorological Aspects of the Proposed SIR Sites at West Milton, New York," October 1951.
17. "Expected Meteorological Conditions for the Weldon Springs Site of the AEC," November 1951.
18. "Area Climatological Summary," 1952.
19. "The Development of a Digital Telemeter System," Myers, R. F., 1952.
20. "Expected Meteorological Conditions for the Livermore Research Laboratory of the AEC," May 1952.
21. "Tables of Wind Direction, Speed and Stability for Mound Laboratories, and Wind Roses for Several Stations in the Dayton Area," September 30, 1952.
22. "A Review of Meteorology and Possible Atmospheric Waste Disposal Problems at the Lockland, Ohio, Site of the AEC," October 1952.
23. "Dispersion of Airborne Wastes in the 7500 Area," October 19, 1952 (also ORNL–1407).
24. "Climatological Data for Tower A–E," October 24, 1952.
25. "Meteorological Estimates for a Fluorine Stack," January 19, 1953.
26. "A Review of Southern New England Weather," April 1953.
27. "Wind Direction Frequencies Pertinent to IET Reactor Location," April 1953.
28. "Climatology and Meteorology of the TSF Site," April 10, 1953.
29. "Estimate of Dispersion of Airborne Activity from the TSF," April 20, 1953.
30. "Difference in Dust Concentrations Between 5 and 15-Ft. Levels in the ANP Area," June 1953.
31. "Sound Propagation Beneath a Temperature Inversion," August 1953.
32. "An Investigation as to the Possibility that Peaks of Particle Densities in July 1953 Were Due to a Source on the NRTS," September 1953.
33. "A Report on a Feasible Meteorological Telemetering System for Oak Ridge, Tennessee" (undated).
34. "Estimates of Ground Concentrations from the 7500 Stack" (undated).
35. "Maximum Ground Concentrations from the 7500 Stack," (undated).
36. "Estimates of Dispersion of Airborne Activity from ORR," 1954 (also ORNL-1794).
37. "Some Characteristics of Medium Scale Turbulence Near 100 Meters at Brookhaven National Laboratory," McCormick, R. A., 1954.
38. "Engineering Climatology for the AEC Portsmouth Area Plant Site," January 1954.
39. "Estimated Ground Concentrations of CPP Effluent After Proposed Increase of Operations," February 1954.
40. "Frequencies of Low Visibilities at Oak Ridge, Paducah and Portsmouth," February 2, 1954.
41. "Frequency and Duration of Periods of Wind Directions Suitable for IET Operations," April 1954.
42. "Notes on Diffusion Conditions Pertinent to Experiments Proposed in ANL-WHZ–373," May 10, 1954.
43. "Meteorology for the Proposed Location of the Army Packafied Power Reactor, Fort Belvoir, Virginia," June 1954.
44. "Calculations for Unit Emissions of Airborne Contaminants," July 1, 1954.
45. "Meteorological Aspects of the Proposed Air Force Engineering Test Reactor WADC, Wright-Patterson AFB," August 1954.
46. "Metorological Report on the Test Conducted Near the EBR Site," August 1954.
47. "Meteorology for the Proposed Critical Assembly Area Battelle Memorial Institute, Columbus, Ohio," August 1954.
48. "A Comparison of Isolated Mountain Peak and Free Air Temperatures," October 14, 1954.
49. "Dispersion of Airborne Clouds in Melton Valley," November 16, 1954.
50. "An Investigation of Atmospheric Diffusion Using Neutral Balloons," (undated).
51. "Hazards from Airborne Activity," 1955 (also ORNL–1834).

52. "Meteorological Parameters in Waste Disposal," 1955.
53. "On the Form of the Energy Spectrum in the Anistrophic Range," McCormick, R. A., 1955.
54. "On the Variation with Height of Sutton's Diffusion Coefficients in the Boundary Layer," McCormick, R. A., 1955.
55. "Relative Average Annual Ground Concentrations of I^{131} from the ICPP Stack," March 1955.
56. "Estimation of Environmental Hazards of Airborne Radiation from the APPR," June 6, 1955.
57. "Meteorology for a Proposed NACA Nuclear Facility at Sandusky, Ohio," September 1955.
58. "Meteorology for the Proposed Critical Assembly Area, Hartford, Connecticut," September 1955.
59. "Meteorological Conditions Relating to the Location and Height of the ETR Stack," October 4, 1955.
60. "Preliminary Climatological Appraisal of Northeastern Colorado," (undated).
61. "Site Conditions for the Proposed Indian Point Nuclear Steam Electric Station at Indian Point, New York," (undated).
62. "Meteorological Aspects of the Areas Near Belle Meade General Depot, Sharpe General Depot, and New Cumberland General Depot," 1956.
63. "Relations between Eulerian and Lagrangian Turbulence Spectra and Correlations in the Atmosphere," Gifford, F. G., Jr., (abstract published by University Microfilms, Ann Arbor, Michigan, 1956).
64. "Rainfall Averages and Extremes in the Upper TVA Water Shed," January 16, 1956.
65. "Meteorological Information for OMRE," February 28, 1956.
66. "Meteorological Appraisal of the Quehanna, Pennsylvania Site of the Curtis Wright Aircraft Corporation," May 1956.
67. "Wind Velocity Profiles at Brookhaven National Laboratory During Various Lapse Rate Conditions," DeMarrais, G. A., July 2, 1956.
68. "Preliminary Report of Winds on Jackass Flats," August 10, 1956.
69. "Wind Study at the Gravel Gerty Site, NTS," August 17, 1956.
70. "An Experiment to Examine the Confluence of Airflow over the ANP Experimental Site at the NRTS," October 1956.
71. "Meteorological Summary and Recommendations for Proposed Combustion-Engineering Site, Windsor Locks, Connecticut," October 1956.
72. "Meteorology for the Army Ionizing Radiation Center, Sharpe General Depot, Stockton, California," December 1956.
73. "Second Report of Winds on Jackass Flats," December 3, 1956.
74. "Meteorological Conditions at the National Reactor Testing Station," (undated).
75. "Meteorological Report on the Burning Experiment," (undated).
76. "Recent Meteorological Studies for the North End of the National Reactor Testing Station," (undated).
77. "Release of Effluent from the RALA Process," (undated).
78. "Wind Roses for Low Altitudes at Yucca Flat in April," (undated).
79. "A Relay Tester for Eight and Twenty Pin Socket Based DC Operated Relays," 1957.
80. "Climatological Review for Dawsonville, Georgia," 1957.
81. "Dispersion of Airborne Activity from the Graphite Reactor," 1957.
82. "Dispersion of Airborne Activity from the ORR," Gifford, F. G., Jr.
83. "Evaporation at the Waste Pit Site," 1957.
84. "Notes on Quantitative Smoke Plume Analysis," 1957.
85. "Turbulent Diffusion in the Atmosphere," Chapter 3, Diffusion of Air Pollution in Industrial Regions (Report of World Meteorological Organization working group on turbulent diffusion in the atmosphere—to be published), 1957.
86. "Percentage Frequency of Wind Direction, Wind Tower 3," January and February 1957.
87. "400 Area Temperatures and Relative Humidity Data," January 4, 1957.
88. "A Simple Relation for Determining Axial Air Concentrations in the Vicinity of Visible Gas Plumes," May 1, 1957.
89. "Percentage Frequency of Days with Persistent Winds by Direction for Wind Station 4, Project 400," July 17, 1957.
90. "Preliminary Climatological Survey of the San Juan, Puerto Rico Area," August 8, 1957.

91. "Summary of 31 Cases in the Study of Atmospheric Turbulence at Brookhaven," Van der Hoven, I., August 12, 1957.
92. "Puerto Rico Hurricanes," August 16, 1957.
93. "Height of Atmospheric Turbulence Layer Under Isothermal Conditions," August 23, 1957.
94. "Proposed Direct Reading Vertical Wind Instruments," Wehmann, G., September 1957.
95. "Average Speed and Directional Change Profiles over NTS," October 1957.
96. "Wind Roses, Dave Hall Reactor Site," November 1957.
97. "Third Report of Winds on Jackass Flats," December 9, 1957.
98. "An Objective Wind Forecast Technique for the National Reactor Testing Station," Mansfield, H. R. (undated).
99. "Comparison of Diffusion Parameters Measured at Other Sides to Those Used at the National Reactor Testing Station," Islitzer, N. F., (undated).
100. "Computation of Sutton-Type Diffusion Coefficients from Visible Limits of Smoke Concentrations" (undated).
101. "Meteorological Control of ETR Air-Cooled Experiments" (undated).
102. "Precipitation Occurrence Recorder," Wehmann, G. (undated).
103. "Progress Report on Investigations of Wind Direction Range and Diffusion Coefficients," Islitzer, N. F. (undated).
104. "Notes on Winds in Area 12," Forecasting guide (undated).
105. "The Role of Meteorology in Air Pollution" (Submitted to World Health Organization, November 1957).
106. "Diffusion Parameters for NTS," 1958.
107. "Eddies and Circulations in Area 12," 1958.
108. "Inversion and Stability Forecasting," 1957.
109. "Low Level Wind Forecasting," 1958.
110. "Mountain and Valley Winds," 1958.
111. "Reliability of Wind Forecasts at NTS," 1958.
112. "Subsurface Temperature Variation," 1958.
113. "Summary of Weather Conditions in the Oak Ridge Area," 1958.
114. "Weather Forecasting at NTS," 1958.
115. "Wind System Classification," 1958.
116. "A Preliminary Meteorological Analysis of the Windscale Incident," January 1958.
117. "Particle Terminal Velocities in a Fluctuating Atmosphere," Gifford, F. G., Jr., and Culkowski, W. M., March 1958.
118. "Preliminary Consideration of an Objective Forecast Technique for the NRTS," Mansfield, H. R., March 1958.
119. "Preliminary Estimate of Environmental Hazards Associated with the Proposed Puerto Rico Research Reactor," March 4, 1958.
120. "Meteorological Estimates for Portsmouth, New Hampshire, and Mare Island, California," April 1958.

Appendix II

List of Reports Prepared by the U.S. Geological Survey for the Reactor Development Division, U.S. Atomic Energy Commission up to May 1959

ALASKA

1. Hydro-Geology of a part of the Anchorage Area, Alaska, by R. M. Waller and D. J. Cederstrom. December 1958.

CALIFORNIA

1. Memorandum on ground-water conditions in the eastern part of Livermore Valley, California, by J. F. Poland and P. R. Wood. March 1954.

COLORADO

1. Geology and ground water of Rocky Flats area, Jefferson County, Colorado, by Melvin R. Mudge and Richard F. Brown. 1952.
2. Notes on the geology and water resources of two areas in Weld County, Colorado, by George D. DeBuchananne. May 1956. This is a compilation of available data and did not entail a field investigation.
3. Outline of the Geology and Ground-water Resources of the Denver, Colorado Area, with special reference to the Rocky Mountain Arsenal, by G. D. DeBuchananne. December 1958.

4. Dispersion Test on the South Platte River near Kersey, Colorado, by W. T. Miller, R. E. Glover, and M. Skougstad. October 1958.

CONNECTICUT

1. Memorandum on Hartford Area, Connecticut. Prepared by the U.S. Geological Survey. May 1953.
2. Government Reservation at Middletown, Conn., Hartford Research Center, by E. S. Simpson. May 3, 1955.
3. Geology and hydrology of the Government Reservation near Middletown, Connecticut. A Preliminary report to the United States Atomic Energy Commission. By E. S. Simpson. September 1955.
4. Outline of proposed Geological Survey activities in geologic and hydrologic investigations at Middletown, Conn., site of Hartford Research Center, by N. J. Lusczynski. January 24, 1956.
5. Resume of ground-water conditions at the CANEL site near Middletown, Conn., and recommendations for future investigations. Transmitted to C. V. Theis by J. E. Upson. January 21, 1957.
6. Preliminary Report on ground-water conditions at the Hartford Research Center, CANEL site, near Middletown, Connecticut, by J. A. Baker and S. M. Lang. 1959.

GEORGIA

1. Geology and hydrology at the proposed site of Lockheed Aircraft Corporation Nuclear Development and Propulsion Facilities near Dawsonville, Georgia, by R. M. Richardson. January 1957.
2. Infiltration and permeability studies of the weathered crystalline rocks, Georgia Nuclear Aircraft Laboratory site, Dawson County, Georgia, by J. W. Stewart, J. T. Callahan, E. Santos, M. G. Croft and C. W. Sever. November 1958.
3. Results of a geologic and hydrologic investigation at the site of the Georgia Nuclear Aircraft Laboratory, Dawson County, Georgia, by J. T. Callahan, J. W. Stewart, R. L. Wait, and H. E. Cofer, with a section on surface water, by R. F. Carter. November 1958.

IDAHO

1. IDO–22000–USGS. Geology and ground water at Site 7, Reactor Testing Station, Idaho, by J. R. Jones and P. T. Voegeli. October 1950.
2. IDO–22001–USGS. Geology and ground water at Site 2A, Reactor Testing Station, Idaho, by J. R. Jones and P. T. Voegeli. May 1951.
3. IDO–22002–USGS. Geology and ground water at Site 3, Reactor Testing Station, Idaho, by J. R. Jones, Morris Deutsch, and P. T. Voegeli. May 1951.
4. IDO–22003–USGS. Geology and ground water at Site 1 and an adjacent area to the East, Reactor Testing Station, Idaho, by R. L. Nace and P. T. Voegeli. June 1951.
5. IDO–22004–USGS. Geology and ground water in the central construction area, Reactor Testing Station, Idaho, by R. L. Nace, J. R. Jones, P. T. Voegeli, and Morris Deutsch. May 1951.
6. IDO–22005–USGS. Memorandum Report on pumping test of Arco Reactor Testing Station Production Test Well No. 1, with recommendations for well finishing, by R. L. Nace, to Manager, Arco Reactor Testing Station, AEC. August 24, 1949.
7. IDO–22006–USGS. Results of pumping test on MTR Production Well 1, Arco Reactor Testing Station, Idaho, by J. W. Stewart. April 1, 1950.
8. IDO–22007–USGS. Memorandum: Results of Pumping Test No. 2 on MTR Production Well acl, Arco Reactor Testing Station, Idaho, by J. W. Stewart. April 1950.
9. IDO–22008–USGS. Memorandum: Results of pumping test on STR Production Well 1, Atomic Energy Commission Reactor Testing Station, Idaho, by J. W. Stewart. August 1950.
10. IDO–22009–USGS. Memorandum: Results of discharge-drawdown test on Navy Well No. 2, Atomic Energy Commission Reactor Testing Station, Idaho, by J. W. Stewart. March 12, 1951.
11. IDO–22010–USGS. Memorandum: Results of Pumping Test on CPP Production Well No. 1, Atomic Energy Commission Reactor Testing Station, Idaho, by R. L. Nace and J. W. Stewart. April 20, 1951.

12. IDO–22011–USGS. Results of tests on wells at Sites 3 and 7, Reactor Testing Station, Idaho, by J. W. Stewart. December 1951.
13. IDO–22012–USGS. Reconnaissance of the geology in the Arco Atomic Reactor Testing Station, Idaho, by R. L. Nace and J. R. Jones. April 1950. Revised.
14. IDO–22013–USGS. Logs of water wells, Reactor Testing Station, Idaho, by J. R. Jones and S. L. Jones. January 1952.

IDO–22014–USGS number was not used.

15. IDO–22015–USGS. Logs of test holes in the Central Snake River Plain, Idaho, by J. R. Jones and S. L. Jones. February 1952.
16. IDO–22015–USGS–Supplement 1. Logs of test holes in the Central Snake River Plain, Idaho, by J. R. Jones, S. L. Jones, and E. G. Crosthwaite. January 1953.
17. IDO–22015–Supplement 2. Logs of test holes and wells in the Central Snake River Plain, Idaho, by P. T. Voegeli and N. B. Crow. July 1954.
18. IDO–22015–USGS–Supplement 3. Logs of test holes and wells in the Central Snake River Plain, Idaho, by A. E. Peckham, J. R. Houston, and E. H. Walker. 1959.
19. IDO–22016–USGS. Ground-water recharge from the Big Lost River below Arco, Idaho, by R. L. Nace and J. T. Barraclough. January 1952.
20. IDO–22017–USGS. Water levels in wells in Bingham, Bonneville, Butte, and Jefferson Counties, Idaho, by Eugene Shuter and G. E. Brandvold. April 1952.
21. IDO–22018–USGS. Investigations at the National Reactor Testing Station, Idaho—Report of plans, progress, and fiscal status. By R. L. Nace. March 17, 1952.
22. IDO–22019–USGS. Geology of Site 14 and vicinity, National Reactor Testing Station, Idaho, by Morris Deutsch and S. W. West. April 1952.
23. IDO–22020–USGS. Memorandum: Construction possibilities at the National Reactor Testing Station, Idaho, by R. L. Nace. April 22, 1952.
24. IDO–22021–USGS. Memorandum: Water supply and waste disposal at proposed ANPR site, National Reactor Testing Station, Idaho, by R. L. Nace. September 5, 1952.
25. IDO–22022–USGS. Geology and ground water in the northeastern part of the National Reactor Testing Station, Idaho, by Morris Deutsch, P. T. Voegeli, R. L. Nace, and J. R. Jones. August 1952.
26. IDO–22023–USGS. Geology, ground water, and waste disposal at the Aircraft Nuclear Propulsion Project Site, National Reactor Testing Station, Idaho, by Morris Deutsch, R. L. Nace, and P. T. Voegeli. December 1952.
27. IDO–22024–USGS. Altitude and configuration of the water table beneath the National Reactor Testing Station, Idaho, by R. L. Nace. March 1953.
28. IDO–22025–USGS. Potential construction sites in the central western part of the National Reactor Testing Station, Idaho, by P. T. Voegeli and S. W. West. March 1953.
29. IDO–22026–USGS. Geology and hydrology of Site 6, National Reactor Testing Station, Idaho, by Morris Deutsch. May 1953.
30. IDO–22027–USGS. Geology, water supply, and waste disposal at Sites 11 and 11A, Burial Ground D, and vicinity, National Reactor Testing Station, Idaho, by P. T. Voegeli and Morris Deutsch. June 1953.
31. IDO–22028–USGS. Geology and ground-water resources of a part of western Jefferson County adjacent to the National Reactor Testing Station, Idaho, by Morris Deutsch, R. L. Nace, and Eugene Shuter. February 1954.
32. IDO–22029–USGS. Progress report on operations of stream-gaging station, Big Lost River near Arco, Idaho, water year 1953, by Wayne I. Travis. April 25, 1954.
33. IDO–22030–USGS. Progress report on operations of stream-gaging station, Big Lost River near Arco, Idaho, water year 1954, by Wayne I. Travis. October 1955.
34. IDO–22031–USGS. Water supply and waste disposal for proposed Engineering Test Reactor, Large Ship Reactor, and Organic-Moderator Testing Station, Idaho, by R. L. Nace. November 1955.
35. IDO–22032–USGS–Part 1. Geography, Geology and Water Resources of the National Reactor Testing Station, Idaho. (In 5 parts, and 2 appendices.)
    Part 1. Purpose, history and scope of investigations. By R. L. Nace. 1956.

IDO–22033–USGS–Part 2. Geography and Geology, by R. L. Nace, Morris Deutsch, and P. T. Voegeli. 1956.
Appendix I, Basic Data on Geography and Geology, by R. L. Nace, Morris Deutsch, and P. T. Voegeli. 1956.
IDO–22034–USGS.
Part 3. Hydrology and water resources, by R. L. Nace, J. W. Stewart, W. C. Walton, and others. 1959.
Part 4. Geologic and hydrologic aspects of waste management, by R. L. Nace (in review). 1959.

36. Analysis of aquifer tests at the National Reactor Testing Station, Idaho, 1949–1957, by William C. Walton. January 1958.
37. Investigations of underground-waste disposal, Chemical Processing Plant Area, National Reactor Testing Station, Idaho, by Alan E. Peckham. 1959.
38. Memorandum Report: Ground-water exploration and development in the Arco area, Idaho, by R. L. Nace. May 24, 1949.
39. Memorandum: Water-supply features and other characteristics of the Pocateello area, Idaho, by Arthur M. Piper. January 2, 1949.
40. Memorandum Report: Water production and waste disposal at Chemical Separations Plant, Idaho Reactor Testing Station, by R. L. Nace. September 27, 1950.
41. Preliminary draft of hydrologic map, showing locations of principal wells and test holes and the inferred water-table contours, as of October–November 1950, in the vicinity, of the Idaho Reactor Testing Station. 1951.
42. Conference on geology and hydrology in relation to planning and operations at the National Reactor Testing Station, Idaho, by R. L. Nace. March 16, 1953.
43. Earth cracks in ANP area and vicinity, National Reactor Testing Station, Idaho, by R. L. Nace. January 20, 1954.

ILLINOIS

1. Geology and ground-water hydrology of the Argonne National Laboratory area. DuPage County, Illinois, by W. B. Allen, W. J. Drescher, and F. C. Foley. 1949.
2. Geology and hydrology of a proposed reactor site at Illinois Institute of Technology, at Chicago, Illinois (Armour Research Foundation) by W. J. Drescher and C. L. R. Holt, Jr. March 1955.
3. Statement concerning the probable effects of increased ground-water withdrawals from the Niagara dolomite at Argonne National Laboratory, DuPage County, Illinois, by E. F. LeRoux and W. J. Drescher. January 1959.

MARYLAND

1. Geohydrology of a proposed nuclear reactor site near Gaithersburg, Maryland, by E. G. Otton. January 1959.

MASSACHUSETTS

1. A reconnaissance of hydrologic conditions in a portion of Maynard Ordnance Storage Depot, Massachusetts, by E. S. Simpson. May 1953.
A Supplement: Tabular material by E. S. Simpson. June 1953.
2. A reconnaissance of the hydrologic conditions in a portion of the Maynard Ordnance Storage Depot, Massachusetts. Revised by E. S. Simpson. July 1953.
3. Seismic survey Maynard Ordnance Test Stations, Maynard, Mass., by David F. Barnes, U.S. Geological Survey. November 1, 1955.

MINNESOTA

1. The geology and hydrology in the vicinity of the Elk River Minnesota Nuclear Reactor Site, with reference to the accidental spilling of radioactive material, by R. F. Norvitch, Robert Schneider, and R. G. Godfrey. September 1958.

MISSOURI

1. Preliminary investigation of ground-water occurrences in Weldon Springs area, St. Charles County, Missouri, by Claude M. Roberts. December 1951.
2. Further notes on problems of the Weldon Springs Area, by C. V. Theis. 1951.

NEBRASKA

1. Ground-water conditions in the vicinity of Hallam, Nebraska, by C. F. Keech. November 1958.

NEW JERSEY

1. The Middlesex, New Jersey, area (Middlesex Sampling Plant): A hydrological report, by E. S. Simpson. March 1954.
2. Geology and ground water of the General Depot, Belle Mead site, New Jersey, by Paul R. Seaber. August 1956.
3. Hydrology of the Delaware River and aquifers in the Camden-Philadelphia area, by S. M. Lang, C. N. Durfor, and R. H. Tice. July 1958.

NEW MEXICO

1. Preliminary report on the geology and hydrology of the Valle Grande area, New Mexico, by C. V. Theis, C. S. Conover, and R. L. Griggs. February 1950.
2. Pumping test on wells at Los Alamos, New Mexico, by C. V. Theis and C. S. Conover. June 1950.
3. Pumping test on Guaje well 1, Los Alamos, New Mexico, by C. S. Conover. September 1950.
4. Geologic background of waste and water-supply problems at Los Alamos, New Mexico, by C. V. Theis. October 1950.
5. Geologic Map of the Los Alamos area.
6. Geology and pumping test report of Guaje Canyon well 1A near Los Alamos, New Mexico, by James E. Weir, Jr., and John F. Waldron. 1955.
7. Geology and ground-water resources of the Los Alamos area, New Mexico, by R. L. Griggs. 1955.
8. Reconnaissance hydrologic investigations of the Pojoaque Valley, Santa Fe County, New Mexico, by J. E. Weir, Jr. February 1956.
9. Geology and hydrology with respect to the contamination hazard at proposed reactor site, Albuquerque, New Mexico, by B. W. Maxwell. Preliminary: Subject to Revision—Not for public release. April 1957.

NEW YORK

1. BNL 58 (C–11). Brookhaven Conference Report. Waste Processing. 1. Brookhaven National Laboratory Waste Problems. March 27-28, 1950. June 1950.
   Wallace de Laguna contributed to this report.
2. An electrical resistivity survey in the vicinity of Brookhaven National Laboratory, Long Island, New York, by George J. Edwards. 1950.
3. Suggestion for a well, or wells, for monitoring the ground water in the vicinity of the waste-storage tanks and other areas, by Wallace de Laguna. March 19, 1952.
4. Report on geology and hydrology of Brookhaven National Laboratory, Parts I, II, III, and IV, by Wallace de Laguna and others. 1958.
5. Ground-water conditions in the Buffalo area, New York, in relation to radioactive-waste disposal by the Atomic Energy Commission, by Theodore Arnow. March 1, 1949.
6. Tonawanda area, New York: A hydrological report relating to its use as a site for burial of contaminated scrap, by E. S. Simpson. February 1953.
7. Memorandum on visit to Carborundum Metal Products Company, Akron, New York, by C. V. Theis. February 3, 1954.
   This has reference to disposal of ammonium salts.
8. Geology and occurrence of ground water at Atomic Energy Commission Project K–2–The Knolls Laboratory near Schenectady, New York, by E. S. Simpson. April 2, 1948.
9. Preliminary report of the geology and ground-water conditions along Glowegee Creek about 1 mile west of West Milton, New York, by E. S. Simpson. March 10, 1948.
10. Tabulation of the results of chemical analyses and radiometric determinations on water samples collected from ground- and surface-water sources in the vicinity of the Atomic Energy Commission's facilities at Schenectady and West Milton, New York. Data collected in 1948 and 1949.

11. Hydrology and water utilization of Mohawk River and associated streams in KAPL area, by W. A. Beetem, F. H. Ruggles, and E. S. Simpson. Preliminary report for Administrative Use Only. October 1952.
12. Hydrologic and tracer studies in the Mohawk River at Knolls Atomic Power Laboratory, New York, by E. S. Simpson, F. H. Ruggles, and W. A. Beetem. For Administrative Use Only—Not for public release. March 18, 1954.
13. The West Milton area, New York: A hydro-geological report pertaining to the burial of contaminated waste, by E. S. Simpson. January 1955.
14. An electrical resistivity and seismic survey to assist in studying groundwater conditions near West Milton, New York, by R. E. Miller, R. M. Hazelwood, and George J. Edwards. May 1955.
15. Report on ground-water studies performed for Atomic Energy Commission at Schenectady, New York, during the fiscal year ending June 30, 1948, by M. L. Brashears. July 15, 1948.
16. Radiotracer experiments in Mohawk River, New York, to study sewage path and dilution, by E. S. Simpson, W. A. Beetem, and F. H. Ruggles. Presented at A.G.U. meeting. Published in Trans. Am. Geophys. Union. Spring 1957.
17. Geology and hydrology of the West Milton area, Saratoga County, New York, by F. K. Mack, F. H. Pauszek, and J. R. Crippen. (Part 1 of 2 parts.) 1959.
18. Tables 24–35 of the report entitled Geology and Hydrology of the West Milton Area, Saratoga County, New York, by F. K. Mack, F. H. Pauszek, and J. R. Crippen.
19. Preliminary report on the geologic and hydrologic conditions in the vicinity of the refuse-disposal area of the Knolls Atomic Power Laboratory, by Ralph C. Health. November 21, 1957.
20. Supplement No. 1 to the Preliminary Report on the Geologic and Hydrologic Conditions in the vicinity of the refuse-disposal area of the Knolls Atomic Power Laboratory, New York, by Jordan Tannenbaum. June 17, 1958.
21. Hydrologic and tracer studies in Mohawk River at Knolls Atomic Power Laboratory, New York (revised comprehensive report), by E. S. Simpson, W. A. Beetem, F. H. Ruggles, Jr., and others. May 1958.

OHIO

1. The geology and ground-water conditions in the vicinity of Luckey, Ohio, with reference to methods of waste disposal at the Brush Beryllium Company plant, by Stanley E. Norris and John D. Winslow. October 1950.
2. Conditions governing the occurrence of ground water in the Fernald area, Ohio, with reference to the possibilities of contamination by disposal of chemical wastes, by George D. Dove and Stanley E. Norris. September 1951.
3. Geology and ground water in the vicinity of General Electric Company site, Lockland, Ohio, by Morris Deutsch and C. V. Theis. September 1952.
4. Hydrology of a proposed reactor site near Columbus, Ohio (Battelle Memorial Institute), by Stanley E. Norris. August 1954.
5. Memorandum on the geology and hydrology of a proposed site for an engineering-test reactor at the Wright-Patterson Air Force Base, near Dayton, Ohio, by W. C. Walton. August 1954.
6. Addendum to memorandum on the geology and hydrology of a proposed site for an engineering-test reactor at the Wright-Patterson Air Force Base, near Dayton, Ohio, by W. C. Walton. April 1955.
7. Memorandum of the geology and hydrology of a proposed reactor site near Sandusky, Ohio, by Stanley E. Norris. September 1955.
8. Memorandum report to Mr. Arthur E. Gorman from C. V. Theis, entitled "Visit to Atomic Energy Commission's Fernald, Ohio, Area. October 31, 1955.
9. Hydro-Geology of the Piqua Area, Ohio, by Stanley E. Norris and Andrew M. Spieker. July 1958.

PENNSYLVANIA

1. The geology and hydrology of the Bettis Field area near Pittsburgh, Pennsylvania, with reference to a spilled liquid, by E. S. Simpson. April 20, 1951.

2. Reconnaissance of the geology and hydrology of a proposed site for the Curtiss-Wright Corp., Nuclear Development and Propulsion Facilities, near Karthaus, Pennsylvania, by George D. DeBuchananne. April 1956.

SOUTH CAROLINA

1. Part 1. Interim report on ground-water investigations in parts of Aiken, Barnwell, and Allendale Counties, South Carolina, prepared for Savannah River Operations Office of the Atomic Energy Commission. June 30, 1953.
   Part 2. Interim report on ground-water investigations in parts of Aiken, Barnwell, and Allendale Counties, South Carolina, prepared for Savannah River Operations Office of the Atomic Energy Commission. June 30, 1953.
   By: G. E. Siple.
2. Geology and ground water in parts of Aiken, Barnwell, and Allendale Counties, South Carolina, by G. E. Siple. May 1958.

TEXAS

1. Geology and ground water at Consolidated-Vultee Aircraft Assembly Plant, Fort Worth, Texas, by R. M. Richardson. August 1952.
2. Geology and hydrology involved in proposed flight tests of Convair, by C. V. Theis. December 1952.

UTAH

1. Pumping tests on Atomic Energy Commission Supply wells in the vicinity of the AEC Uranium Ore Processing Mill, Monticello, Utah, by W. Baird Nelson. February 1956.

VIRGINIA

1. Memorandum on the geology and hydrology of a proposed reactor site at Fort Belvoir, Virginia, by G. D. DeBuchananne. June 1954.
2. Ground-water conditions with special reference to the effect of accidental spillage of radioactive waste at a reactor site, Fort Belvior, Virginia, by P. M. Johnston. May 1955.

WASHINGTON

1. Geologic and Hydrologic features of the Richland area, Washington, relevant to disposal of waste at the Hanford Operations Office of the Atomic Energy Commission, Interim Report No. 1, by G. G. Parker and A. M. Piper, prepared in cooperation with the Atomic Energy Commission. July 1949.
2. Geologic Conditions affecting practicability of gas storage in old Rattlesnake gas field, by R. C. Newcomb. 1950.
3. Tests of artesian wells in the Cold Creek area, Washington, by Don H. Hart. January 1952.
4. Preliminary report on the aquifer-evaluation test in the 100–K area, AEC Hanford Reservation, Washington, by Jesse R. Strand and Donald H. Hart. October 1952.
5. Repair of leaking artesian wells in the Upper Cold Creek Valley, Benton County, Washington, by R. C. Newcomb. January 1953.
6. Geology and ground-water characteristics of the Hanford Reservation of the Atomic Energy Commission, Interim Report No. 2, by R. C. Newcomb and J. R. Strand. December 1953.
7. Hydrologic investigation of proposed reactor site, State College of Washington, Pullman, Washington, by B. L. Foxworthy and R. L. Washburn. August 1955.

MISCELLANEOUS

1. Work of the Geological Survey in connection with sanitary engineering problems of AEC. Presented at Chicago Conference of Sanitary Engineering of AEC. Approved by AEC for publication. By C. V. Theis. September 11, 1952.
2. Hydrologic phenomena affecting distribution of fallout materials from nuclear bursts, by C. V. Theis. July 1953.
3. Treatment and disposal of waste in atomic energy industry. Prepared for presentation at meeting of the A.A.A.S. and G.S.A., Boston, Mass., by Arthur E. Gorman (of AEC) and C. V. Theis. September 29, 1953.

4. Geologic and hydrologic factors in ground disposal of waste. Presented at Baltimore Conference of Sanitary Engineers. Open File. By C. V. Theis. 1955.
5. Radioactive-waste disposal from the geologist's viewpoint, by C. V. Theis.
6. Problems of ground disposal of nuclear wastes. Prepared for presentation at the International Conference on Atomic Energy, at Geneva, Aug. 8–20, 1955. Approved for publication in *Peaceful Uses for Atomic Energy*. Open File. By C. V. Theis. August 1955.
7. A review of the ground-water geology of the major waste-producing sites. Published in *Proceedings of Conference on Radioactive Waste Disposal*, by C. V. Theis. Open File. 1955.
8. Some of the geologic factors which influence waste disposal into pits, by Wallace de Laguna. 1955.
9. Factors controlling the temperature rise within radioactive wastes buried in the earth at depth. Presented at the Second Nuclear Engineering and Science Conference, at Philadelphia, March 11–14, 1957. Approved for publication, by Herbert E. Skibitzke. March 1957.
10. Salt investigations in Arizona, Nevada, and Idaho, by Richard A. Young. May 1958.
11. Trace Elements Investigations Report 725. Summary of rock salt deposits in the United States as possible disposal sites for radioactive waste, by W. G. Pierce and E. I. Rich. May 1958.
12. Trace Elements Investigations Report 703. Problems in the disposal of acid aluminum nitrate high-level radioactive waste solutions by injection into deep-lying permeable formations. Published as Geological Survey Bulletin 1088. By Edwin Roedder. 1959.
13. Preliminary geologic and hydrologic evaluation of potential burial grounds for solid radioactive waste at Pine Bluff Arsenal, Jefferson County, Arkansas; Rocky Mountain Arsenal, Adams County, Colorado; and Dugway Proving Ground, Tooele County, Utah, by G. D. DeBuchananne. 1959.
14. A survey of analytical methods for the determination of strontium in natural water. (In process for publication as Chapter "A" of Water-Supply Paper 1496, of the Geological Survey.) By C. Albert Horr. 1959.
15. Activities of the United States Geological Survey in problems of radioactive-waste disposal. Statement prepared for the Special Subcommittee on Radiation of the Joint Committee on Atomic Energy, U.S. Congress, by R. L. Nace. February 3, 1959.
16. The disposal of low and intermediate level radioactive wastes to the ground. Statement prepared for the Special Subcommittee on Radiation of the Joint Committee on Atomic Energy, U.S. Congress, by C. V. Theis. February 1959.

MISCELLANEOUS SITE REPORTS

In addition to the foregoing listed reports, reports on the geology and hydrology of numerous sites and localities have been furnished to the Atomic Energy Commission, as follows:

Alabama: Tuscaloosa.
Colorado and other States: Streams in Colorado, Kansas, Missouri, Nebraska, Oklahoma, and Texas. (Magnitude of minimum daily discharge.)
Colorado: Rocky Flats. Weld county (two areas).
Florida: Suwannee River.
Indiana: Terre Haute.
Louisiana: Lake Charles.
Michigan: Tittabawassee River.
New Mexico: White Sands Proving Grounds.
Ohio: Portsmouth (Pike County).
Oklahoma: Idabel.
Pennsylvania: New Cumberland Depot area, Young Womans Creek.
South Carolina: Hawthorne, Parr (near Parr—proposed site for nuclear reactor of spherical type), Rocky Mount, Santee River.
Texas: Paris (six sites: 40 miles east of Paris; 15 miles southeast of Navasota; opposite Belleville near Brazos River; southeast of Austin near Colorado River; area across Jackson and Wharton Counties; area in Jasper and Newton Counties).
Utah: Utah Lake.
Vermont: West Addison.

Virginia: Lake Drummond.
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Chairman ANDERSON. You may proceed.

Mr. GRAHAM. Mr. Smith will take up the next section.

STATEMENT OF OSCAR S. SMITH, DIRECTOR, OFFICE OF INDUSTRIAL RELATIONS, ATOMIC ENERGY COMMISSION

Mr. SMITH. This presentation will:

(1) Sketch a profile of the sources of people and their training which our experience has indicated are used in the licensing and control of radioactive material;

(2) Summarize AEC activities in assisting to develop a pool of persons with the needed basic training; and

(3) Describe AEC activities in meeting specific training needs in the radiological safety area.

Here we are talking about the training of a general pool of labor from which all may draw and not the training of individuals.

AEC experience in building a professional staff to carry out its regulatory functions provides a practical basis for determining the kinds and sources of personnel needed for such work. This experience is buttressed by experience in the contractor-operated programs where radiological safety training to meet program needs has been carried on for many years. In AEC's regulatory program profesional personnel have been selected to perform particular jobs at the time the need for these jobs arose. The backgrounds of personnel selected have been rather broad, covering the entire spectrum of the scientific and engineering fields.

A review of the educational backgrounds of professional employees in the AEC regulatory program indicates that the majority were educated in at least two disciplines, such as a combination of engineering and one of the physical sciences or the life sciences.

The radioactive hazards of atomic energy have awakened a realization of the need for better controls on other sources of radiation. This increases the demand for personnel of the above types, particularly in the areas of inspection and regulation and evaluation of the hazards of various sources of radiation. In the States which have undertaken programs for the control of radioactive sources, the number of non-atomic-energy sources is greater than the number of atomic energy sources. Except for differences in degree similar basic training is required for all sources.

AEC supports an extensive program of assistance to colleges and universities which helps equip them to provide basic technical training in this as well as in other nuclear areas. This assistance program takes the form of grants for the purchase of special equipment to use in

courses oriented toward engineering, physical sciences, the life sciences, and the industrial use of radioisotopes.

In the physical sciences and engineering, the program is primarily intended for qualified engineering institutions offering nuclear curricula at the graduate level.

Qualified 4-year institutions may also receive AEC assistance in obtaining equipment for nuclear physics and radiochemistry laboratories. The equipment purchased with AEC grant funds is used in teaching such topics as nuclear physics, radiochemistry, reactor physics, reactor engineering, fuel metallurgy, chemical processing of fuel materials, instrumentation, and heat transfer. The equipment includes teaching reactors, subcritical assemblies, reactor simulators, heat transfer loops, nuclear particle detection instruments, metallurgical furnaces, solvent extraction columns, and similar items.

In the life sciences the intent is to further the production of more scientists, better trained in the field of radiation, biology, and the use of isotopes in research. Acceptance of proposals, therefore, is contingent upon evidence that the equipment desired will be used in such courses.

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Appendix A which is offered for the record summarizes the grants that have been made under these several programs.

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Approximately 400 teachers have participated to date. Three hundred and forty participants this year will increase the total to 740 by the end of this summer. Two shipments per academic year of isotopes in generally licensed quantities are provided to teachers who successfully complete the course, and beginning this summer, a manual of laboratory experiments and demonstrations in radioisotopes with biological applications adaptable for use in high school classrooms will also be provided.

This year an arrangement identical with the high school teachers' institutes has been established for biology teachers from liberal arts colleges. Two such college teacher institutes will offer training for 20 teachers each in courses in radiation biology this summer.

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The AEC pays operating expenses, plus grants for stipends on a matching-fund basis, and travel expenses. To date, 340 faculty members from 109 engineering institutions, plus 29 faculty members from technical institutes have participated in a total of 16 summer institutes covering basic and nuclear technology, instrumentation and control, nuclear metallurgy, reactor physics, and use of teaching reactors in chemical processing.

In addition to the summer institute program, AEC contractors provide temporary research appointments to university faculty so they may acquire further experience in their specialities. As an example, during 1958, 84 faculty were employed by Argonne, 52 by Oak Ridge National Laboratory, 45 by Brookhaven, and 8 at Hanford operations.

The Commission also provides certain assistance to students. An AEC fellowship program in nuclear technology was established in 1956 for 150 fellowships per year. Initially, this was restricted to the first year of graduate study with the course content restricted to basic nuclear technology. It has since been broadened to include the nuclear aspects of conventional engineering and scientific disciplines. Awards are now granted for second and third year graduate study as well as the first year. Fellowships currently pay tuition costs, stipends of $1,600, $1,800, and $2,000 per calender year for first, second, and third year, respectively, and a maximum allowance of $350 per calendar year for dependents.

Forty-two universities are now enrolled in this program. All have broad graduate nuclear programs leading to a master's degree, and in many cases the doctorate also. For the 1958–59 academic year, 135 fellows are in attendance: 93 at the first year level; 38 at the second; and 4 at the third.

The Commission also assists in developing the base of personnel with nuclear training in a variety of additional ways, including, but not limited to, the following:

1. A work experience program: Actual work experience may be arranged at Commission installations when the knowledge and training desired is not available outside of Commission facilities, when the employee appears qualified to take full advantage of the work experience, and when the assignment can be arranged without undue burden on the regular Commission work.

2. Training for reactor supervisors: A training program has been established at Shippingport for supervisory personnel of organizations engaged in or planning the design or operation of nuclear powerplants. The course which started in February of this year with 24 students will take 6 months—3 months of classroom instruction, followed by 3 months of work experience at Shippingport. A tuition fee of $2,000 per student is charged.

3. Industry seminars: Several times a year AEC sponsors industrywide seminars on technical subjects related particularly to reactor development and isotope application.

4. Contractor personnel training: Although adequate quantitative statistics are not available, the Commission's contractors have varied training programs broadening thousands of employees engaged in work on atomic energy. Such programs range from 1- or 2-hour briefings on specialized subjects to providing time, expense, and facilities for graduate research toward degrees.

Formalized training activities are prevalent throughout the program, and on-the-job training of a semiformal nature is common.

Arrangements have been made with universities to provide courses, many conducted at contractor facilities, with the employer paying all or part of the fees for attendance. Training through these media is directed to all educational levels, encompasses the scope of the atomic energy program, and contributes to providing the Nation with individuals trained and qualified to work on the development of atomic energy.

Turning now to the specific area of radiation protection, specialized training is required for personnel in the regulatory function and also for other personnel such as:

(*a*) radiation specialists employed by concerns using sources of radiation;

(*b*) nonspecialist employees working with or in proximity to such sources; and

(*c*) public safety personnel who need training in radiological safety primarily to know what to do in the event of accident.

In somewhat the same category fall employees of transportation companies.

In respect to programs designed to train health physicists, industrial hygienists, radiation monitors, inspectors, and others as full-time specialists in radiation protection, AEC supports the following kinds of training:

(1) Training by contractors of their own radiation specialists: In a previous report, published as part V of the Joint Committee's print on "Selected Materials on Employee Radiation Hazards and Workmen's Compensation," the Commission described radiation protection training for these specialists as advanced specific and advanced general training.

During a typical year, there were 21 courses given to 1,100 employees in the advanced general category and 30 advanced specific courses given to 660 employees. These courses normally run from 25 to 30 hours each and cover special subjects such as industrial ventilation problems, damage control, and exposure counting statistics.

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1,000. Turnover among this group runs about 14.6 per 100 per year. Contractor programs both keep personnel up to date in the field and fulfill the need created by this turnover. The people who leave the contractors are part of the pool of trained and experienced personnel available to other organizations working in this field.

2. Fellowship programs related to radiological protection: Graduate fellowships are offered in the field of radiological physics, industrial hygiene, and industrial medicine.

Fellowships in radiological physics and industrial hygiene are administered by the Oak Ridge Institute of Nuclear Studies. The industrial medicine fellowships are administered by the University of Rochester. Since 1955, about 8 appointments have been made each year in the industrial hygiene and 8 in the industrial medicine programs; since its beginning in 1948, over 400 fellows have studied under the radiological physics program.

The radiological physics program is designed to train college graduates for positions in radiological physics by providing fundamental knowledge in radiation physics and biophysics, interaction of radiation with matter and living systems, dosimetry, electronics, and instrumentation, some understanding of the principles of permissible exposure and the prevention of undesirable exposure, and an introduction to the legal and public relations aspects of radiation protection.

Fellows spend an academic year at their assigned university and then go directly to an Atomic Energy Commission laboratory for 3 months of practical training.

The universities and laboratories in the program are: Vanderbilt University, Nashville, Tenn., and Oak Ridge National Laboratory; University of Rochester and Brookhaven; University of Washington—at Seattle—and Hanford Operations; and University of Kansas and Hanford Operations.

The industrial hygiene program is designed to train college graduates in the new and complex problems which have resulted from nuclear energy and from other contemporary developments. This field now includes the study and control of the more common occupational diseases and of other environmental factors affecting employee health, such as radiation, heat, fatigue, and mechanical hazards.

Course work varies with the university and with the interests and undergraduate preparation of the individual. Fellows are required to take courses in public health and biostatistics and may elect courses in engineering, health physics, toxicology, industrial medicine, and related fields. Participating universities are the University of Pittsburgh Graduate School of Public Health; the Harvard University School of Public Health; and the University of Cincinnatti, Institute of Industrial Health.

The industrial medicine program consists of 1 or 2 academic years, with lecture and laboratory instruction in the practice of industrial medicine, industrial hygiene, industrial toxicology, nuclear physics, biophysics, biostatistics, and the public health aspects of occupational medicine. This may be followed by an in-plant year at one or more of the major operating plants and laboratories of the Atomic Eneregy Commission.

During this past year, the Commission has provided for qualified States employees engaged in radiological health activity in connection

with atomic energy in their States to attend courses offered under a program of training in radiation control. Under this program four State personnel are attending such a course at the University of Michigan.

Under the work experience program previously mentioned such personnel may participate directly in the daily operations at one of the Commission's plants and gain practical experience in radiation control.

In this connection, I would like to call attention to section V of the AEC report printed in "Selected Materials on Employee Radiation Hazards and Workmen's Compensation." This section summarizes various training by other Government agencies in the area of radiological safety. Some of these, particularly the Public Health Service and the Bureau of Labor Standards, have also furnished reports which are included in the committee print for the present hearing.

In respect to employees working with, or in proximity to, radioactive materials, training needs may be identified both from AEC experience, and from special studies. Training in radiation has been provided on an in-plant basis by AEC contractors in some cases for more than 15 years. The effectiveness of this training is evidenced by the favorable safety records. The present programs may be viewed as a satisfaction of needs demonstrated by experience. While significant differences appear between plants, there is much simillarity in both content and method. In general, variations in content are related to

(1) the nature of the plant; and
(2) the work performed by the employees.

Variations in method are related to plant organization and the division of responsibility between supervisor and radiation specialist. A review of 40 training programs shows that the basic training usually includes all of the items shown on appendix B—which is offered for the record—but with considerable variations in emphasis.

Normally, training starts with a few hours' orientation to the plant, which is followed by additional and continuing training by the supervisor or the health physicist in an in-plant basis. As the individual moves from one job to another, he gets specialized training as needed to safely perform the new work. The training content normally will be expanded in the case of supervisors and supplemented by more advanced material.

The Stanford Research Institute recently conducted a study for AEC of training needs related primarily to nuclear power generation. The study concluded that two general types of training were needed for all personnel working in nuclear powerplants. The first, for which a suggested course outline was prepared, is a survey of nuclear energy and powerplant applications. The second, for which course material is presently being developed, is on principles of radiation and radiation protection. Beyond these, Stanford concluded there is need for additional specialized training related to the specific work activities of the employees.

Up to the time, the need for training in radiological safety of industrial personnel at the nonprofessional level has been met almost entirely on an in-plant basis. The Stanford course outline is designed for use in vocation schools.

A joint memorandum has gone forward from AEC and the Office of Education to all State directors of vocational education describing the material and its availability.

At the same time, we have arranged for Stanford to prepare additional material designed to adapt the course to isotope and other applications. In addition, jointly with the Department of Labor, we are planning the development of material for use by apprenticeship representatives in promoting radiological safety training in industrial plants. The vocational schools and the aprentice programs provide the framework and source to which industry and labor normally turn for training assistance. If appropriate courses can be worked into these, the increased supply of workers with a minimum acquaintanceship with radiation will be helpful in starting new plants using radiactive materials; training will be facilitated for workers in existing plants that are contemplating using such materials; and such courses can provide needed training for public safety, transportation, and other personnel.

All organizations with activities in the atomic energy field are to be surveyed this fall and periodically thereafter by the Department of Labor for the Atomic Energy Commission. Data will be collected by the principal occupational categories and will be used in assessing current and advance requirements which will help in developing additional programs and policies related to manpower and training.

Turning now to public safety employees, as public safety organizations may be called in following an accident, their employees need to be informed about hazards that exist and the appropriate action in respect to such hazards.

In the hearings on employee radiation hazards and workmen's compensation, a report was inserted in the record which had been prepared by a working group of employees from several agencies. This report identified the need for a short course of, say, 2 to 4 hours, for public safety, public health, and transportation personnel in small communities without radiation users but where radioactive materials might be involved in case of transportation accidents, and a second course of longer duration—about 24 hours—designed for personnel concerned with public safety and public health in communities using radioactive material.

In the Commission's report which has been included in the committee print for this hearing, we refer to instructors' training for municipal fire and police departments. This program is described more fully on page 83 of the Commission's report included in the "Selected Materials on Employee Radiation Hazards and Workman's Compensation," and in my testimony in that hearing.

The course material used in standardized and furnished as a packet, including suitable visual aids, to persons attending a 3-day instructors' course given by AEC personnel. Arrangements for the course are made locally with emphasis to date on firemen. About 2,000 instructors located in 46 States have completed the course and are now including this material in the instruction they give to local firemen.

In at least two States—Pennsylvania and California—the State vocational people have incorporated this course in a larger program

of their own. For instance, the fire instructor program is being given for the second time in the State of Pennsylvania, but the presentation will be largely by the State's own staff with AEC furnishing an instructor only on one afternoon.

In summary now, the Commission's total program of training assistance involves.

1. Assistance grants to colleges and universities for use in providing aids and equipment needed to expand the base of personnel with nuclear training in the several disciplines from which skills are drawn for atomic energy development and radiological safety.

2. Assistance to faculty through institutes and special employment opportunities.

3. Assistance to students through certain fellowship programs in the areas of nuclear technology of radiological physics, industrial hygiene, industrial medicine, and State radiological health activity.

4. At the nonspecialist level, we offer a fire instructor training course to the State and municipal fire schools and are developing various course materials, which, through the cooperation of the Office of Education, is available to State vocational schools. In cooperation of the Bureau of Apprenticeship and Training of the Department of Labor, course material is planned for use in skill training programs under which that Bureau may give assistance to private plants using radioactive sources.

5. Further assistance pointed primarily to industry is available through a work experience program, a reactor supervisors training program, and various industrywide seminars.

Of significance also are nuclear safety and skill development programs of several trade unions, particularly those of the Boilermakers and Pipe Fitters, with which we have cooperated for some time. These programs were described rather fully in testimony by representatives of these organizations in the workmen's compensation hearings in March.

I might add one other thing: Turning to the very excellent print that the committee issued in connection with this hearing, I noticed on page 407 that there was a listing of accepted forms of training assistance which were commonly given States. The Commission has used all of these forms of assistance, and more.

I think the principal comment to be made with respect to them is that we are relying relatively little on the special school approach which was mentioned there, but, rather, are assisting the established colleges, universities, and vocational schools to develop their capabilities through our programs of grants for teaching aids and equipments and through assistance and development of course content.

I might mention one other thing here that Commissioner Graham has just called to my attention which would probably interest you.

In several of your earlier hearings, including the workmen's compensation hearing, mention has been made of a desire on the part of some labor unions for a course pointed directly for their top people. I believe that in the workmen's compensation hearing Mr. Goodman commented that we had arranged such a course. This started the week after your workmen's compensation hearings.

The entire staff subcommittee of the AFL–CIO, with which you are probably familiar, was invited, along with a few other people

they wanted to bring. They spent 3 days in Washington and 2 days at Argonne.

We started out by going into rather elementary fundamentals in radiation matter and went from there to an opportunity to go out and see some of the research programs going on at Argonne and which were explained to them by the Argonne people. It was pointed to this area of radiation protection and we received some very favorable comments from all of the people in attendance. They are probably very happy about it.

We will probably repeat it, if they desire, in 6 months or so.

Chairman ANDERSON. Are there any questions?

If not, thank you very much.

(Apps. A and B to Mr. Smith's statement follow:)

APPENDIX A

Summary of grants made by AEC to educational institutions as of May 15, 1969

	Number of institutions participating	Number of grants	Amount granted
Engineering and physical science (nuclear equipment and instructional material)	106	174	$10,900,000
Radioisotopes technique	13	13	331,704
Life sciences (radiation biology, agriculture, veterinary medicine, medicine and pharmacy, public health, biology	110	152	1,810,707
Total	229	339	13,042,411

APPENDIX B

LIST OF SUBJECTS CONTAINED IN A TYPICAL BASIC RADIATION PRODUCTION TRAINING PROGRAM (BASED ON A COMPOSITE OF 40 ORGANIZATIONS)

1. General Orientation, Company and AEC Programs, Nature of Work.
2. External and Internal Radiation.
3. Effects of Radiation on the Body.
4. Radiation Control—Based on Time, Distance and Shielding.
5. Exposure Limits, NCRP Requirements, Company Practices, Allowable Units of Radiation.
6. Film Badge Practices—Importance, How to Use Them.
7. Records, How Kept, Employee's Responsibility.
8. Contamination and Control, Cleanliness, Eating, Drinking, Ventilation.
9. Monitoring—Personnel and Area.
10. Signs, Warning Tags, Restricted Areas.
11. Health Protection Service and Work in Radiation Areas, How to Get Hygiene Help.
12. Change Room Procedures.
13. Emergency—Spills, First Aid—What to Do.
14. Criticality, What Is It, Rules, Criticality Committee or Officer.
15. Fissionable Materials—Accountability Procedures.
16. General Safety, Safety Meetings.
17. Fire Fighting—Fire Protection, Housekeeping, Explosive Hazards.
18. Uranium—Sources, Nature, Poison.
19. Personnel Protection—How to Use: Clothing, Masks, Shoes, Boots, Gloves, Coveralls, Helmets, Safety Glasses.
20. Work Permits—Meaning of, When Required and Available Services in Regulated Areas.
21. Accident Investigation.

Chairman ANDERSON. Now, Mr. Graham, do I understand that some of these other papers can be filed?

Mr. GRAHAM. Yes, sir.

Chairman ANDERSON. They can be filed?

Mr. GRAHAM. Yes, sir; they can be filed.

(The statement of Mr. H. L. Price follows:)

REGULATION OF THE USES OF NUCLEAR MATERIALS AND FACILITIES

Presented by H. L. Price, Director, Division of Licensing and Regulation, U.S. Atomic Energy Commission

The Commission administers a comprehensive system of licensing and regulation to protect the health and safety of employees and the public from radiation hazards. These hazards may arise out of the manufacture, possession, use, and transfer of source material (uranium and thorium), special nuclear material (plutonium, U^{235} and U^{233}), byproduct material (usually referred to as radioisotopes), and utilization facilities (nuclear reactors). The Commission does not have regulatory jurisdiction over such other sources of radiation as X-ray equipment or radium or over the mining of uranium. The Commission's regulatory program is designed to determine that licensees have adequately trained staffs, have adequate equipment, and that they have appropriate procedures to assure protection of employees and the public from radiation hazards.

The Division of Licensing and Regulation is responsible for the development and administration of licensing regulations, the issuance and denial of licenses, and the institution of appropriate administrative enforcement proceedings. The Division of Inspection is responsible for inspection of licensees to determine their compliance with Commission requirements.

Licensing procedures involve the evaluation of a variety of radiation hazards and determining the adequacy of radiation controls proposed by applicants for licenses. Required controls vary greatly with the type of material or facility and their proposed use.

RADIOISOTOPES (BYPRODUCT MATERIAL)

Radioisotopes are more widely used than any of the other materials or facilities regulated by the Commission. Because of their diverse use in different forms and the variation in the levels of activity, radiation control problems vary greatly. For convenience in indicating radiation control problems, radioisotopes are discussed under the following categories: (1) medical uses, (2) industrial uses, (3) research and development uses, (4) field uses, (5) consumer product uses, (6) waste disposal.

Medical uses

Except for specialized research, radioisotopes are used medically for either diagnostic or therapeutic purposes. The levels of radioactivity used for diagnostic work are generally much lower than those used therapeutically.

For diagnosis doctors are usually authorized to possess up to approximately 10 millicuries of radioactivity. The levels of activity administered to individual patients are much lower and are generally in microcurie range.

Specalized laboratory facilities are not required to handle these low levels of radioactive material. The radioisotopes are stored and transported in the container in which the material was shipped from the supplier. Protection can be provided by placing equipment on trays, by handling the radioactive material with simple tongs, and by following well-known control techniques.

Higher levels of activity are required for therapeutic uses. Possession limits for therapeutic purposes may range up to a few curies. Usually the quantities handled at any one time are less than 100 millicuries. Control techniques are similar for those required for handling diagnostic levels but specialized handling equipment and laboratory facilities are required depending upon the type and level of activity. Approximate shielding must be provided for storage and for protection while preparing the materials for administration and while administering them to patients. The shielding may consist of lead pots for transport and storage and lead bricks for improvising barricade shields. By use of remote handling equipment, operations can be performed over and around the barricade. Specialized shields are used for protection during administration of the materials. They may consist of a fraction of an inch of plastic for protection from beta ray exposure to lead shields for protection from gamma exposure. If the materials are processed before administration to patients, a specialized fume hood may be required to prevent air contamination. In diagnostic work,

a monitoring instrument for low level activity is required to check for possible contamination of equipment, facilities, or personnel. For therapeutic work, an additional instrument is required for determining the adequacy of shields and predicting the amount of exposure personnel may receive during manipulations. The equipment and facilities required in both diagnosis and therapy is greatly simplified if the radioisotopes are procured commercially in prepared, sterilized, and calibrated doses. For example, diagnostic doses of iodine 131 may be procured in capsules thereby eliminating the need to handle the material in solution. Such preparations are now widely available.

The use of high levels of gamma emitting radioisotopes such as cobalt 60 for deep therapy requires more specialized control measures. As much as 2,000 curies of cobalt 60 may be used in a teletherapy device. These devices consist of a sealed source of the radioactivity encased in lead shields with ports which can be opened to direct the radiation to the area of treatment for the patient. The unit must be used in a heavily shielded room since during treatment the level of radiation passing through the port is very high. These devices require careful review to determine that the shield is adequate and the mechanism for opening and closing the ports is approximately designed and functional. Also, the teletherapy unit must be mounted so that the beam is directed only in areas where the room is adequately shielded.

Industrial uses

The radiation protection problems associated with the use of radioisotopes in industry vary widely. Radioisotopes are most widely used in industry as sources of radiation as (1) industrial radiography, for making radiographs; (2) thickness gases, for measuring the thickness or density of materials; (3) liquid level gases, for controlling the levels of liquids; and (4) irradiators, for irradiating materials. The radiation protection problem associated with these uses is primarily control of external exposure since the radioisotopes are contained in sealed sources which are fabricated, sealed, and manufactured in accordance with specifications defined in the license of the manufacturer.

Industrial radiography

Radiographic procedures are widely used in the foundry and construction industries to detect voids and other imperfections in structures, welds, etc. Since highly penetrating radiation is required, gamma emitting radioisotopes such as cobalt 60, cesium 137, and iridium 192 are widely used as sources of radiation. The levels of activity vary from a few millicuries up to thousands of curies. Handling techniques include open-air transfer of sources on the end of fish poles or magnetic poles, remotely operated cameras, and remote manipulations in heavily shielded rooms or concrete cubicles. Fish or magnetic pole techniques may be used for activity up to the equivalent of one curie of cobalt 60. Portable cameras consisting of a shielded source with a remotely operated port may be used for activity up to the equivalent of 20 to 25 curies of cobalt 60. Above these levels, the sources are handled remotely in shielded rooms or cubicles.

Camera and fish pole techniques provide portability for work in isolated areas within a plant or outdoors, as for example, in the radiographing of pipeline welds as the pipeline is being laid across country. Control of exposure from sources in shielded rooms and cubicles include posting of signs, installation of warning lights, electrical interlocks in doors and special instruments capable of activating alarm devices as may be required. On the other hand, when pole and camera techniques are used exposure must be controlled through use of survey instruments, posting of signs, erecting barriers, roping off of areas, and by exercising close supervision.

Thickness gages

Thickness gages are widely used in the paper, cigarette, and other industries when accurate measurement of thickness or densities are required. Thickness gages have a high degree of built-in safety. The radioisotopes, strontium 90, cesium 137, krypton 85, and cobalt 60 are commonly used in levels ranging from a few millions up to several hundred millicuries. Control is affected by built-in safety through designs, appropriate labeling of devices and posting of areas. They are usually on production lines. Once the device is installed it requires little or no attendance except an occasional calibration and test for leakage of the radioactivity from the sealed source.

Because of the high degree of safety built into these devices, experience has indicated that those of certain designs can be distributed under a general license when they are manufactured and labeled according to specifications approved in a specific license. An amendment to part 30 of the Commission's regulations establishing procedures and requirements regarding such devices was issued in February 1959.

Liquid level gages

Liquid level gages are used to measure the levels of liquids in steel tanks and other containers. The device which is usually mounted in a fixed position has a high degree of built-in safety. The level of activity may vary from a few millicuries up to a hundred millicuries of isotopes such as cobalt 60 and cesium 137. Once the device is installed, little or no maintenance is required. Protection can usually be provided by labeling and posting procedures.

Irradiators

Gamma emitting radioisotopes such as cobalt 60 and cesium 137 are used as sources for irradiating materials to determine the effects of radiation, to initiate chemical reactions, to irradiate foods for preservation purposes, etc. In general the levels of activity are high but they may vary from a few curies up to a hundred thousand curies. The irradiators may be self-contained units of thick lead shields in which the radiation source is mounted and into which the materials may be inserted for irradiation. Also, irradiators may consist of especially designed concrete cubicles with elaborate remote control handling equipment. Despite the fact that the levels of radiation are high, exposure problems are simplified by proper design of the irradiators and by the fact that the operation consists essentially of the insertion and removal of samples to be irradiated. However, to assure safety, labeling, posting, warning lights, electrical interlocks, etc., may be required.

Before a license is issued for use of each particular type of radiographic camera, thickness gage, liquid level gage, and irradiator unit, a detailed review is made of the design, fabrication, and method of sealing of the source and the design and the operational characteristics of the device. Likewise, the shielding sufficiency of rooms, concrete cubicles, etc., must be determined and the adequacy of remote handling equipment must be evaluated. These reviews and evaluations may be made from supporting information accompanying the license application including blueprints and sketches of designs or by an on-the-spot visit to examine prototype devices.

The levels of activity used in industrial laboratories engaged in producing radioactivie pharmaceuticals and the design and fabrication of sealed sources and devices vary from the millicurie to hundreds or thousands of curies and equipment requirements vary too greatly for general characterization.

Research and development uses

Radioisotopes are used in industry widely for research and development purposes, as for example, in wear studies, pilot studies for process control, mechanisms of chemical reactions, etc. The levels of activity used for such purposes are usually low varying from microcurie to millicurie levels.

Radioisotopes are widely used for research and development purposes not only in industrial laboratories but also in universities and institutions. The type of radioisotopes and the levels of activity vary greatly but the levels used very seldom exceed a few hundred millicuries.

Laboratories used for these purposes may require special fume hoods, with remote handling equipment, shielding for manipulations and for storage surveying and monitoring instruments and other specialized facilities as required. The typical research laboratory consists of two or three rooms.

Field uses

A limited number of licenses have been issued for studies involving the controlled release of radioisotopes into the environs. Examples of such field uses include fluid flow studies in oil wells and in streams. The quantities and dilutions involved in most field studies usually provide for radiation concentrations which are sufficient for technical measurements but which are a very small fraction of permissible levels.

A license application for field use must include a detailed analysis of the known factors of topography and hydrology, dilutions to be provided under the control of the licensee, additional dilution provided by the environment, proximity of

occupied areas, and other details which permit a determination that released activity is not likely to return to man in concentrations or quantities exceeding the maximum permissible concentrations for unrestricted areas. This evaluation must take into consideration possible reconcentration in the environs.

Consumer products

The Commission has taken a conservative approach to permitting the use of radioactive material in consumer products. There have been a number of proposed uses for the manufacture and distribution of devices containing low levels of radioactivity and for the use of radioactive material in process control in a manner in which low residual activity would end up in a product. A few devices such as static eliminators and electron tubes containing very low levels of radioactivity have been licensed for distribution under a general license. These licensing procedures for these devices are similar to those followed for generally licensing thickness gages. The electron tubes contain submicrocurie levels of activity whereas the static eliminators may have up to millicuries of activity. This activity is, however, contained in a sealed source and there is a high degree of built-in safety. The general license is applicable only to devices that are manufactured, tested, and labeled in accordance with specifications contained in a specific license authorizing supply of such devices under general license.

Also, the Commission has licensed the addition of radioactive materials for purposes of process or other controls where very low levels of residual activity may end up in the product. In considering any widescale use of radioisotopes for process control, consideration must be given not only to the amount of activity ending up in any one product but also to holding the activity in products in general to an acceptable minimum.

The Commission has decided that it is safe to permit very low concentrations of radioisotopes to be used as tracers in process control which may end up as residual activity in the final product. A proposed regulation has been published for public comment to exempt from licensing low concentrations of radioisotopes in products except those designated for ingestion and inhalation by human beings (foods, beverages, cosmetics, and drugs). These low concentrations are based upon the maximum permissible concentrations for continuous exposure for individuals in unrestricted areas. To prevent buildup of activity in the environs and to minimize exposure to the most hazardous radioisotopes, certain long-lived materials (such as strontium 90, cesium 137, and alpha emitters) would not be permitted to be used for such purposes. The Commission will have an opportunity to evaluate each such specific use of radioactive materials since a licensee may not introduce the material into commercial products without a manufacturing license.

Waste disposal

Under the regulations there are only four ways to dispose of wastes: (1) by burial of small quantities in land, (2) by limited disposal in the sanitary sewer system, (3) by release of effluents in specified low concentrations, or (4) by transfer of the material to another licensee for subsequent disposal. The regulations provide for consideration of alternative methods such as incineration and ocean disposal and for consideration of the disposal of higher levels of wastes on an individual basis. These alternative methods and levels are permitted only upon approval of the Commission of specific applications. Such applications must provide information from which the Commission can make an analysis to determine that the procedure is safe. The levels of activity specified in the regulations are so low as to be considered safe under projected conditions of disposal.

In general the levels of radioactive wastes resulting from the use of radioisotopes are low. Only a small percentage of the radioisotopes procured by a licensee ends up as wastes, particularly when the material has a short half life. The problem is usually that of controlling bulk and volume rather than level of activity. Control techniques are relatively simple. Materials must be appropriately packaged and stored for safe transportation and ultimate disposal. Liquid wastes must be packaged to minimize the possibility of leakage or spillage. Procedures for waste control and for protection of personnel in handling and storing of these materials are well known and relatively simple to follow.

A special evaluation is made before a licensee is permitted to dispose of radioactive materials by incineration. An applicant for a license to dispose of radioactive waste in the ocean must submit a detailed description of the radioactive

material, including the quantities and kinds of material and the proposed manner and condition of disposal. The applicant must also include detailed information on container and packaging specification, packaging and storage area, transportation facilities, instrumentation for measurement of radiation levels and contamination, radiation safety procedures to be followed in collecting, storing, packaging, and transporting the material; emergency procedures; site location of disposal, including depth of water at proposed location and records of disposal which are to be maintained.

A prelicensing visit is usually made to the applicant prior to issuing such a license. During this visit a careful review is made with the applicant of the proposed program to determine that it can be conducted in accordance with the regulations and any special terms or conditions as may be added to the license. A firsthand evaluation is made of the site for packaging and storage of radioactive waste.

Eight concerns are now licensed to offer a commercial waste disposal service. These concerns are located on the east and the west coasts. They are disposing of their materials either by shipment to the Commission for disposal in its burial grounds or by disposal in the ocean. The possession limit for these licensees varies from 1 curie to 1,000 curies; but, in general, the total material possessed at any one time is much lower than the possession limit.

Source materials

In the processing mills, uranium ore is converted to uranium metal oxides and fluorides. Because of the low level of radiation emitted by uranium, external exposure presents practically no problem. In the milling process, however, considerable dust is created during the crushing process which presents an internal hazard unless properly controlled. The dust is not highly radioactive and does not present a problem outside the mill. The dust hazard may be controlled by enclosing operations creating dust, by utilizing ventilation procedures, and by providing personnel with respiratory protective devices. Mill effluents containing uranium and radium must be properly controlled to prevent contamination of streams or the creation of environmental hazards. Control may be exercised by proper monitoring procedures to control levels of activities discharged and by the use of hold-up ponds and storage areas. Inspection of the mills and studies by the Commission and other Federal and State agencies indicated that there are problems concerning dust concentrations in the mills and there may also be problems presented by discharge of mill effluents. Products of the uranium mill to be used as reactor fuel are sent to the Commission's facilities for enrichment by the gaseous diffusion process or for processing otherwise. Some of the materials from the mills are made available to the licensees. Materials procured by licensees may be used for both nuclear and nonnuclear purposes. Some of these uses are:

Nonnuclear use:

1. Airplane and missile components.
   - (*a*) Thorium-magnesium alloy.
   - (*b*) Uranium counterweights.
2. Shielding.
   - (*a*) Shipping containers.
3. Ceramics.
   - (*a*) Tableware.
   - (*b*) Glassware.
4. Fuel fabricators.
   - (*a*) Blankets.
   - (*b*) Prototypes.
   - (*c*) Conversion.
   - (*d*) Waste recovery.
5. Analytical.
   - (*a*) Chemical reagents.
   - (*b*) Calibration sources.
6. Medical aids.

Nuclear use:

1. Subcritical assemblies about 2,500 kilograms uranium, aluminum-clad, used essentially in universities under RD grant.
2. Research and development.
   - (*a*) Basic research.
   - (*b*) Fuel element development.

In manufacturing and fabrication of products containing source material there is a potential dust hazard which is generally controlled through "wet operation" procedures and proper ventilation. When these materials are used in liquid form as for spraying on glazes, operations should be performed in hoods and operators may need to wear respirators for protection against air suspended mists. External exposure is controlled by well known methods.

SPECIAL NUCLEAR MATERIAL

The principal licensed licensed uses of special nuclear material are:

(1) Fuel element fabrication.
(2) Processing of unirradiated special nuclear material
(3) Scrap recovery.
(4) Neutron and alpha sources.
(5) Analysis, testing and monitoring.
(6) Instrumentation.
    (*a*) Fission chamber manufacturers.
    (*b*) Calibration equipment.
(7) Gamma irradiation.
(8) Research.
    (*a*) Commercial.
    (*b*) Educational institutions.

The hazards associated with the use of special nuclear materials are substantially greater than those associated with source materials with respect to control from both internal and external exposure. Uranium 223, and plutonium present a potentially significant internal hazard. However, the principal hazard unique to special nuclear material is the possible accumulation of sufficient quantities to create a critical mass. In chemical processing of scrap recovery operations accidental criticality is prevented by the observance of operational methods and procedures to prevent the accumulation of a critical mass during the processing and storage of the material. This involves the design of proper conduits and containers to provide geometric arrangements which will minimize the possibility of criticality and batch and other methods are used to keep masses segregated. These procedures must be supplemented by appropriate monitoring and warning systems.

Fuel elements which have been used in a reactor are highly radioactive from the large quantities of fission products produced and require elaborate remote handling facilities and detailed operating procedures to assure safety.

NUCLEAR REACTORS

The Commission has heretofore presented detailed reports and testimony to the committee concerning its procedures and requirements for licensing nuclear reactors. This portion of the statement is, accordingly, designed merely to identify the general nature of the radiation hazards associated with nuclear reactor operation, and the general nature of the Commission's major research programs directly related to reactor safety.

In the typical nuclear reactor, radioactive fission products are generally of the order of 10 curies of radioactivity for each watt of rated thermal power. Thus, in large reactors in the inventory of radioactive material in the accumulated fission products constitutes the largest quantities of gross radioactive activity outside the Commission's burial grounds for fission products.

Radioactive effluents may be discharged from routine operation of reactors, but the quantities and concentrations involved are low and carefully controlled.

The major potential hazard presented by nuclear reactor operation is from the remote, but not impossible, catastrophe which might cause release into the environment of a part of the fission product inventory within the reactor.

The Commission's procedures and requirements respecting the licensing of nuclear reactors are designed to assure appropriate protection both with respect to normal operation and the remote possibility of an accidental release. To carry out these reviews, the Commission has a reactor hazards evaluation staff including reactor physicists; nuclear, mechanical, electrical, and chemical engineers; experts in heat transfer and thermal phenomena; and experts on pressure vessels, boilers and piping codes, sanitary engineering and waste disposal. The assistance of other Federal agencies such as the U.S. Coast Guard, the Weather Bureau, and the U.S. Geodetic and Geological Survey are frequently obtained. The views of the Advisory Committee on Reactor Safe-

guards are obtained with respect to all applications for power and test reactors and in such other cases as the nature of the safety problems warrant.

Major research programs relating to nuclear reactor safety are being carried out, including those pertaining to fission product release from melted fuel elements; factors affecting water-metal reactions; theoretical studies of reactor dynamics; initiation and penetration of missiles inside of reactor containment vessels; experimental studies on pressure vessels; experimental investigation on scale models of reactor containment vessels; meteorological dispersal of radioactive materials; and factors in harbors relating to dispersal and dilution of radioactive contaminants.

Experimental investigations on reactor transients and dynamic behavior include SPERT, Borax, KEWB, TREAT, and EBR I.

Investigations of fast reactor characteristics include the EBR I, EBR II, and ZPR experiments.

TRANSPORTATION OF NUCLEAR MATERIALS

All of the radioactive materials which we have previously discussed must be transported about the country. This includes thousands of routine shipments of radioisotopes, and the shipment of source and special nuclear materials. Special nuclear materials are shipped in the form of fuel elements and uranium compounds. Spent fuel elements which have been used in reactors for long periods of time and which contain hundreds of thousands of curies of fission products present special problems. Safety in transportation is largely dependent upon the proper design of shipping containers to assure that external radiation levels are kept within safe limits and that containers are designed and constructed so that they are not likely to rupture and release the radioactive contents. Potential hazards of criticality in shipping special nuclear materials is controlled by limiting the quantity of material placed in one container and designing containers so as to maintain safe distances between indivdual containers and thereby prevent the interaction of materials in different containers. Limits are also placed on the number of containers which can be placed in a boxcar or truck.

In shipping irradiated fuel elements, the number of elements in a single container must be limited and the container must be designed in such a way as to prevent criticality under credible conditions of shipment. The containers must be designed and the number of elements limited to insure that heat generated from the intense radioactivity of the fission products is properly dissipated to the outside of the container to prevent the container from melting or rupturing and thereby releasing the fission products.

The Interstate Commerce Commission, the Coast Guard and the Federal Aviation Administration have regulations which cover most routine shipments of radioisotopes and source material. Shipments of special nuclear material (including irradiated fuel elements) must also meet AEC requirements to protect against the special hazards involved in such shipments.

ENFORCEMENT

Reports of inspections of licensee's activities are evaluated to determine the status of compliance of the licensees with AEC regulations. If it appears that a licensee may be in noncompliance with requirements of his license and the Commission's regulations, a notice of alleged violation is issued. The notice calls the facts to the licensee's attention, requests a written explanation and requests prompt submission of a statement of the corrective steps to be taken. If the reply does not satisfactorily explain the noncompliance and assure that further violations will be prevented, the Commission may issue an order to show cause why the license should not be terminated or otherwise modified. In instances where the protection of the public health and safety requires immediate modification of a licensee's practices, or the alleged noncompliance is willful, the Commission's rules permit the Commission to issue orders requiring immediate corrective action or suspension of operations.

COOPERATION WITH FEDERAL AGENCIES

In the administration of its regulatory program, the Commission cooperates with a number of Federal agencies. The Commission cooperates with the Interstate Commerce Commission, Federal Aviation Administration, U.S. Coast Guard, the U.S. Post Office Department in matters pertaining to the regulation

of the transportation of radioactive materials. Currently, the Commission is participating on a committee in the review and revision of the transportation regulations of these agencies which relate to radioactive materials. The Commission also works closely with the Bureau of Customs in matters involving the export or import of Commission regulated materials. Technical advice is furnished also with regard to specific shipments.

The Commission cooperates closely with the U.S. Public Health Service and the Department of Labor as to matters of common interest in the field of radiation protection. Their views are solicited on regulations relating to radiation protection and they are kept apprised of our training and assistance programs. The Commission is also cooperating with the Public Health Service in environmental and pollution studies with respect to the uranium mills.

The Commission also receives technical assistance from a number of Federal agencies with regard to reactor sites, as for example, the U.S. Weather Bureau, U.S. Geological Survey, the Maritime Commission, and the U.S. Public Health Service.

COOPERATION WITH STATE AND LOCAL AGENCIES

Early in the radioisotope distribution program, the Commission recognized the interest of the several States in the public health and safety aspects of its regulatory program. Technical information on radiation protection was made available to the States covering such subjects as shielding, radiation surveying, and monitoring methods and procedures, laboratory design, waste disposal, etc. Upon request, States were supplied names of radioisotope users.

Beginning in 1949, States were routinely supplied lists of all radioisotope users and efforts were expanded to keep them apprised of our regulatory activities. In 1950, a cooperative visitation program was initiated on a broad scale. State personnel were routinely invited to accompany Commission personnel on visits to radioisotope users and the program was coordinated to maximize mutual assistance. Through this cooperative program, States have been kept informed of the development in our evolving regulatory program. By such orientation, State officials have been kept aware of our basic approach in evaluating and controlling radiation hazards.

The areas of coordination continued to expand following passage of the Atomic Energy Act of 1954. Soon after its licensing program was initiated, pursuant to the act, the Commission began sending copies of byproduct material licenses to State officials. Similarly, copies of licenses for source and special nuclear materials and nuclear facilities were supplied to the States. Copies of licenses are now sent to the States on a daily basis. In addition, States are notified when license applications are received and licenses issued for reactors and for commercial waste disposal services.

The Commission has worked closely with the Council of State Governments, as for example, in the preparation of the Coordination of Atomic Development Act which has been recommended by the Council as desirable State legislation. The Commission has also maintained close liaison with various State and regional groups, such as the New England and Southern Regional Advisory Committees on Atomic Energy. The Commission has, upon request, assisted States by review of proposed regulations and legislation, and AEC staff members have participated in State hearings on matters affecting such proposals.

The Commission has entered into an agreement with the American Municipal Association to study the impact of peaceful application of atomic energy on local government. This study is expected to provide guidance in the future for extension of the Commission's cooperative program at the local level of government.

Chairman ANDERSON. Thank you.

Mr. GRAHAM. You have been very kind, sir, in giving us a lot of time.

Chairman ANDERSON. Do you have some comments to make, Mr. Nelson?

Mr. GRAHAM. Do you care to make any comments at all or would you just like to file a statement for the record?

Mr. NELSON. It depends entirely on the timing. I have highlighted this to about 15 minutes, Senator, maybe 20.

Chairman ANDERSON. Will you proceed, please?

STATEMENT OF CURTIS NELSON, DIRECTOR, DIVISION OF INSPECTION, AEC

Mr. NELSON. The responsibility of the Division of Inspection that is most intimately related to the regulatory program of the Commission is exercised primarily by the Office of Compliance, HQ, and by separate inspection divisions in each of eight of the field operations offices.

This responsibility, as stated in section 25c of the 1954 act, is to gather information to show whether or not licensees are in compliance with the rules and regulations of the Commission and with the provisions of the act. This responsibility involves, in most cases, the gathering of information to determine compliance, or lack thereof, with specific conditions of licenses and with specific provisions of the regulations. Of particular importance we believe that in consonance with the purpose and spirit of the 1954 act, the basic objective of the regulatory program, of which the Division of Inspection is a part, is to advance safety in the applications of atomic energy.

With this brief statement of our share of responsibility and our definition of objectives within the regulatory program, I would now like to discuss our compliance inspection program.

Initially the use of isotopes in private industry had been controlled for health purposes, under the Commission's authorization program—1946 act. The former Isotopes Division at Oak Ridge administered this program, and following the enactment of the 1954 act turned over to the new regulatory program about 3,000 authorizations for conversion to licenses. There were also in existence prior to that time several hundred licenses for source material.

As of February 1957, responsibility for inspection of licensee activitives involving source, byproduct, and special nuclear materials was delegated to the field offices. Responsibility for inspection of activities involving reactors remains in the Division of Inspection, HQ, at the present time, although assistance is being obtained on a routine basis from our field offices.

The inspection of reactors must be accomplished by those with extensive experience in both reactor design and operation. This is true since there is not now a set of rigid rules or standards applicable to all reactors that would assure safety.

In addition to examining the state of compliance with existing regulations and special license conditions, it is the job of the inspector to report to the Commission his observations and judgment on overall safety of reactor operation. The depth of this judgment clearly depends upon the training, experience and effort of the inspector. There are at present 65 licensed reactors in various stages of design, construction, and operation subject to regular inspection.

To elaborate a little more on the policy of inspection, I would like to say first of all that from the inception of the program we have thought it necessary and desirable to decentralize the inspection function. We thought this way because we not only wanted to minimize the size and travel distances of a headquarters staff, but because we wanted to take advantage of existing relationships between our field offices and State and local representatives with a view to ultimately working out cooperative agreements with these State people.

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As another matter of policy, we have held, from the very beginning of our compliance inspection program, that the personnel who perform these inspections should be technically competent to gather information necessary to determine compliance with regulations and licenses and to assess and report upon the overall safety of the licensee's operation. As mentioned earlier, the people who conduct reactor inspections are limited to those who have had appreciable experience in the design and operation of reactors, in the preparation and execution of operating procedures and tests and a basic understanding of supervisory and managerial responsibility. It is also true that all inspectors of source, byproduct or special nuclear materials licensees have had actual experience in using these materials, in addition to formal technical education.

Our specific method of inspection and how we use people with this kind of background can be best described by discussing a typical inspection. The field inspection offices are furnished a copy of each license and amendments as they are issued, together with backup information.

This backup includes the license application and supporting information which formed the basis for the license.

This material is reviewed when received in a field office, and the inspection is scheduled with relation to all of the other licenses in that particular office.

When the case is assigned to a representative for inspection, he reviews and studies the information at hand in advance of his visit. He is thus informed on the radioactive material, equipment, the licensee's procedures, type of personnel, and the probable degree of hazard when he visits the premises of the licensee. He first notifies the appropriate State inspection agency so that they may participate. The licensee management is contacted upon arrival.

The work is reviewed in detail, including equipment, facilities, the handling and storage of radioactive material, the procedures in effect, including actual operation, and he interviews the personnel directly involved. He then proceeds to review the licensee's survey methods and results; the personnel monitoring practices and results; posting and labeling used; the instructions to personnel; the methods and apparent effectiveness of maintaining control of people in the restricted area. He reviews the licensee's records of receipts and inventory of licensed material. He may physically check the inventory. He scrutinizes records concerning disposal to the sewerage system and burial in soil if they are pertinent.

This type of review usually provides data sufficient to determine whether or not the licensee is complying with the provisions of the license. The AEC representative may or may not make independent radiation measurement with regard to radiation levels. Most of the time he can readily detect whether or not survey information maintained by the licensee on a continuing basis constitutes a full and adequate evaluation of the radiation hazards associated with the program.

In the course of performing the functions I have described the representative has acquired enough knowledge to recognize whether or not the total program is well managed and safe.

Prior to leaving the licensee's premises, the representative meets with the management to discuss the results of his inspection. During this

meeting, the AEC representative attempts to answer questions concerning the regulatory program. It has been our experience that the licensee usually indicates that corrective action will be instituted immediately to overcome any deficiencies noted.

The inspector then prepares a detailed report setting out all the facts and circumstances that he gathered or observed during the inspection. This report is reviewed in the field office and sent to headquarters with a memorandum of transmittal which includes the field office recommendations together with comments, observations, and opinions with regard to the particular licensed activities inspected. The report and the memorandum are furnished to the Division of Licensing and Regulation for appropriate administrative enforcement action.

If no items of noncompliance were observed, the licensee is so informed. If only minor matters of noncompliance, such as improper signs, failure to label, et cetera, are involved which the licensee agrees to correct at the time of the inspection, the licensee is informed by letter of the items of noncompliance and that corrective action will be reviewed during the next inspection.

If the inspection revealed noncompliance of a more serious nature, the licensee is required to inform the Commission in writing within 15 to 30 days as to corrective action taken and date completed. In these cases an inspection representative will either conduct a prompt follow-up inspection which I will mention later, or the matter is reviewed during a regular reinspection to assure that corrective action has in fact been accomplished. Of course, if the conditions observed during the inspection should constitute a serious potential or actual hazard, the AEC representative reports by telephone and teletype. Enforcement action in the form of a Commission order can then be taken without delay.

Our inspection experience has shown that at the time of inspection about 56 percent of licenses are in compliance.

Chairman ANDERSON. Just what does that mean? Half of them are doing what they are supposed to do?

Mr. NELSON. They have complied with all the rules and regulations even to the minor ones to the *n*th degree. There is no fault we can find.

Chairman ANDERSON. But you find some fault with about 44 percent?

Mr. NELSON. That is true.

Chairman ANDERSON. Do you think that is a little high?

Mr. NELSON. I think not. As I go on I will explain what these faults are in general, Senator. I don't mean to say that I don't think it should be better. It should be, and I believe it will be.

As I mentioned earlier, most of the noncompliance falls in the category of failing to properly post radioactive areas, to label radioactive materials, or maintain adequate records, in strict accordance with the regulations. When these matters are brought to the licensee's attention, he usually takes corrective action without delay.

Chairman ANDERSON. How many times do you go back to inspect? Is it every 6 months or something like that?

Mr. NELSON. It depends on the type of operation, Senator.

Chairman ANDERSON. If 56 percent of the licensees only are in compliance and you are making regular periodic inspections they must not have repaired very rapidly, have they?

Mr. NELSON. We give special attention to those who are not found to be in compliance.

Chairman ANDERSON. I understand that. But on the law of averages, if he went around and found 100 firms and 56 were out of compliance and 6 months later you made a tour and all of those firms were in compliance, are there that many new ones so the level stays at 56 percent?

Mr. NELSON. This is as of the middle of April that we took this figure.

Chairman ANDERSON. Whether it was the middle of March it wouldn't make any difference.

Mr. NELSON. I think it is encouraging to note that our experience shows that they are improving. There are fewer.

Chairman ANDERSON. What was the percentage in 1956, 1957, 1958; do you know?

Mr. NELSON. I don't have the figures here, but I will try to submit them.

Chairman ANDERSON. Are over half in compliance all the time?

Mr. NELSON. I would say that there were more in noncompliance in the earlier years than now.

Chairman ANDERSON. You mean more than 44 percent?

Mr. NELSON. Yes, sir. Our inspection program only got started in 1956.

Chairman ANDERSON. That is why I used 1956.

Mr. NELSON. We inherited about 3,000 licensees at that time.

Chairman ANDERSON. How often do you get around?

Mr. NELSON. I cover this a little later if you would permit me to proceed, Senator.

Representative DURHAM. What do you do if a licensee does not comply? Do you take his license away?

Mr. NELSON. If he doesn't comply, the case is turned over to my associate, Mr. Price, for enforcement action.

Chairman ANDERSON. What does he do to him?

Mr. NELSON. He has all the remedies provided by the act. In some cases the operation is terminated. In others he is given an order to cease and desist, or to do something that should be done. In the lesser cases he may be written a letter and the items of noncompliance called to his attention.

Chairman ANDERSON. You may proceed.

Mr. NELSON. Five percent of the noncompliance items involve conditions which indicate the possible overexposure of individuals, excessive radiation levels, or excessive concentrations of effluents in unrestricted areas.

Chairman ANDERSON. Can you do anything about it? If you find somebody overexposed, do you have to turn it over to Mr. Price to write him a letter?

Mr. NELSON. We do something in every noncompliance.

Chairman ANDERSON. I know. You said you turned them over to Mr. Price, and Mr. Price writes them a letter.

Mr. NELSON. Yes.

Chairman ANDERSON. You don't have anybody with authority to go in there and say, You have too high levels, this should be cut down at once?

Mr. NELSON. I guess you misunderstood. We do tell the licensee where he is in noncompliance. As I tried to bring out, he usually is able to correct these noncompliance items while the inspector is there, if they are of a minor nature.

If they are costly and time consuming, perhaps he doesn't get them done until later. Nevertheless, we do not leave the premises without him knowing what is wrong with his operation. The formal enforcement action, however, is taken properly by the Division of Licensing and Regulation. By excessive we mean levels or concentrations above the part 20 limits.

To this 5 percent, we give particular attention until compliance is attained. We schedule followup inspections to assure that corrective action is properly taken and that the operation is maintained in accordance with the prescribed standards. In general, licensees have cooperated to the fullest extent on matters of corrective action. As a matter of fact, some have suspended their operations on their own volition until corrective action could be completed. They appear sincerely interested in maintaining compliance with regulations as well as safety of operations.

From the experience we have gained, we are not only in a position to assign priorities to our own inspection frequencies, based on the relative potential hazard of the operation, but to make suggestions and provide information useful to other aspects of the Commission's regulatory program.

As of February 1959 we had 39 professional field personnel, supported by about 18 clerical employees. Six additional personnel are now in the process of being added in the four industrial area field offices. This will make a total field inspection force of 45 men in the immediate future.

Representative DURHAM. What kind of qualifications do they have to have?

Mr. NELSON. Typically, Mr. Durham, a graduate in engineering or one of the sciences, an A.B. degree, with 4 or 5 years' experience in this line of work.

Representative DURHAM. He has received training at the AEC's laboratory, has he?

Mr. NELSON. Yes.

Representative DURHAM. Or has he not? Is he just picked up and sent out as an inspector as a man who inspects a farm is or do you require special qualifications?

Mr. NELSON. We require a man who is a graduate in engineering or science and who has generally had 4 or 5 years' experience with ourselves or with one of our contractors in the atomic energy business related to radiation, Mr. Durham.

Representative DURHAM. Is he at least knowledgeable in the matter of radiation? Is that correct or not correct?

Mr. NELSON. In what, sir?

Representative DURHAM. In the dangers of radiation. Does he have some knowledge of that?

Mr. NELSON. Yes, sir. We think there would be no worse policy to follow than to put a man out in this inspection business who does not know his business completely. I think it would be worse than no inspection at all.

Representative DURHAM. I do, too.

Mr. NELSON. On the basis of current estimates, we plan to inspect about 40 percent of the total active licensees in the country with a professional field staff of about 55 to 60 men during fiscal year 1960.

Chairman ANDERSON. Where are you going to get those if you have 39 now?

Mr. NELSON. We generally recruit at our own contractors or universities. We don't find it easy.

Chairman ANDERSON. Maybe I don't know what fiscal year 1960 is. Doesn't fiscal year 1960 start off pretty soon now? Doesn't it start with July 1, 1959?

Mr. NELSON. Yes, sir.

Chairman ANDERSON. Will you have that many ready at that time?

Mr. NELSON. We would expect to have 50 very shortly.

Chairman ANDERSON. How many did you pick up during this year?

Mr. NELSON. Five. We have picked up a couple and we expect to have three or more in the next month. We would hope to pick up another 10 to 15 during the coming fiscal year.

Mr. RAMEY. Do you get people assigned to you from national laboratories or borrow people?

Mr. NELSON. We have not had to so yet. We can do this if it becomes necessary.

Chairman ANDERSON. You understand a lot of these questions are asked here because you have not been up here before. Mr. Price has been here many times. We are happy to find out what is going on.

This is the only exploring expedition we have in this inspection work. I want to let you know that the reputation you bear with us is much greater than the questions would indicate.

Mr. NELSON. Thank you, sir.

This means we will inspect or reinspect the most hazardous type of operations at least twice during the period. Less hazardous operations will be inspected with proportionately less frequency. In addition to our efforts, it is expected that some State agencies, in particular those in the industrial areas, will inspect some AEC licensees. I will discuss later our plan to continue making cooperative inspection agreements with some of these States to assure less duplicative and better inspection coverage.

With regard to radiation incidents involving licensee activities, summaries have been submitted to the committee from time to time. Most recently a list of overexposures was furnished the committee for the workmen's compensation hearings. Without repeating details, since the beginning of the regulatory program two licensed operations have been suspended for health and safety reasons resulting from accidents.

It is a matter of Commission policy to investigate all incidents involving licensed materials, or operations. The AEC investigates all incidents which involve or may involve the exposure of persons to 3 rem or more of radiation. The lesser exposures are not necessarily investigated at the time they are reported, or come to our attention, but are reviewed at a later date during a scheduled reinspection.

Most of the exposure incidents have been due to human failure, such as not following procedures. Others have been related to equipment failures and a few to failure to observe AEC regulations.

It is reassuring to note that since the beginning of the regulatory program, we have had only 12 incidents which warranted an immediate report by the licensee under the reporting requirements of the regulation. There have been about 28 reports under the 24-hour reporting requirement. All of these 40 cases were investigated.

A third group of reports, includes about 54 cases where exposures occurred or accumulated slightly in excess of the standards. These reports are normally reviewed during a later inspection unless some unusual circumstance dictates the need for immediate review.

At this point, I would like to say that we consider our current objectives or problems to be twofold:

(1) To improve the quality of inspections performed by AEC and the States.

(2) To increase the number of inspections performed per unit time, primarily to keep pace with the growth of the program.

To accomplish these objectives, we urge and strive for two goals.

First, within the Commission Inspection Divisions and the various States, we stress the need for highly competent and experienced professional personnel.

Second, we firmly support and have underway a program for education and training of State personnel to cooperate with us in the encouragement of safe and sensible handling of atomic energy materials.

I would now like to say a few words about our program of cooperation with the States.

Our initial planning in 1955 and early 1956 recognized the value and desirability of State participation in the inspection field. The use of byproduct material by private persons was growing and many State agencies had exhibited a real interest in the field of radiation control. This was particularly true in the larger industrial States where the professional staffs included persons with some background in physics, biology, medicine, and other fields related to radiation.

As soon as we established field offices to accomplish inspection functions, the field managers were asked to continue the relationships that had been maintained previously by the former Isotopes Division. They were also asked to expand the working relationship with State agencies to include all States that had an interest in cooperation. This was feasible because each field manager had only a few States in his region and, being closer to them than the headquarters office, could work with them on a day-to-day basis.

In 1956 a more definitive program was initiated for cooperation with State inspection agencies. In substance, this program provided for meetings with the Governor of a State, or his representative, to explore the means by which the AEC and the State inspection agencies could work more closely in a program of cooperation than they had previously. Because there are several interested agencies in some States, in particular the large industrial ones, an effort was made to secure a single channel within the State with which we could work. Our regulatory program was explained in detail, and the matter of on-the-job formal education of State personnel in the field of radiation control were also discussed.

During the same period, the Commission actively supported the model bill proposed by the Council of State Governments which provided for a coordinator of atomic energy affairs.

As you may know, 11 States have since adopted the model bill, or similar legislation, and now have coordinators. We have met with six States under this program. We believe these meetings have been worthwhile, and we intend to schedule more of them in the future.

As a result of the attention given to this matter in 1956, I believe that our field offices today have satisfactory day-to-day working relationships with inspection agencies in the States. Our inspection schedules are made known to them in advance and they are informed of all radiation incidents so they can accompany us on investigations. As you may suspect, these are varying degrees of interest by State personnel. In some States a representative accompanies our personnel on practically every inspection or investigation, whereas, in other States, we do not have this interest.

There are a few States that do not have the personnel to work with us. State personnel have been very cooperative and their competence in the field is increasing. In many cases they have been of material assistance in the conduct of inspections and investigations. There have been occasions where they have gathered information on an independent basis which has been of material assistance to us. We would like to think we have reciprocated in this regard.

We have gone a step further in our cooperative efforts and established a program for informal agreements with States for inspection of AEC licensees. The objective is to seek a practical means to coordinate the AEC inspection program with those of State agencies and to prepare them to assume independent responsibilities.

This program recognizes arrangements should be made to take full advantage of the States' inspection resources and eliminate duplication of effort.

To date we have completed one such arrangement. This is with the State of Connecticut. In this case we deal with the State coordinator.

Since Connecticut has personnel with competence in this field and a regulatory organization, they will independently inspect certain classes of AEC licensees on a prescribed frequency basis, and the AEC will continue to inspect the rest of the licensees in that State. Provisions are made for a full exchange of inspection information to keep the respective inspection organizations fully informed.

State personnel will continue to accompany AEC representatives on inspections and investigations conducted by AEC. This arrangement is only in its initial stage, but we are confident that it provides a practical basis for AEC and State cooperation in the inspection business.

It is our intention to make similar arrangements with other States that possess the prerequisites that I have mentioned.

As you know, under current Federal legislation, the AEC has no authority to delegate or divest itself of responsibility for any groups or classes of licensed activities. However, if a given State and the AEC cooperate on the basis I have just described, both organizations are fully informed with regard to inspection matters and both the State and Federal programs benefit.

As to future relationships between the Commission and the several State inspection agencies, we believe that we have some of the basic ingredients that are needed to encourage and help the States assume more and more responsibility in this field. Our program for inspection agreements will afford State agencies firsthand experience which would appear necessary as a prelude to a State assuming full responsibilities under the proposed legislation that has been submitted by the Commission.

From our observations, we believe that one of the most serious problems the States have right now is that of training their people in the field of radiation control and safety. We all know this is a difficult asset to acquire and it takes time and money. Even money is not the complete answer, because it is difficult to go out on the open market and hire qualified technical people.

In an effort to provide some type of formal training for State inspection personnel in the field of radiation control, last year we established, within the framework of the existing AEC fellowship program, a method by which State personnel, under the auspices of AEC, could attend a university which offered a curriculum in this field. This program is known as our special assistance for training in radiation control. The participant receives an extensive range of training and experience in general health physics problems and specifically in such specialties as personnel monitoring, dosimetry, instrument calibration, shielding, waste disposal, X-ray facilities, and some reactor aspects. In addition, this training is supplemented by related public health courses. State personnel are given a stipend and limited travel and living allowances while they are attending this course, if this is requested.

In the fall of 1958, four State employees matriculated at the University of Michigan for the course, which consists of 1 full academic and 3 months' fieldwork at an AEC installation. They will complete their training in August of this year. In addition to the four mentioned above, two other States have requested the AEC to provide the fieldwork for their two employees this coming summer. We have made the necessary arrangements for these two men to gain this summer experience. We are very gratified and encouraged by the attainments of the men enrolled in this program. We believe that this program merits continued financial support in the future.

We have contacted the State agencies regarding the September 1959 course, and at the moment we have reviewed the applications of 20 candidates from 14 different States. Selections have been made and 10 applicants from 8 States have been accepted.

Frankly, however, we are disappointed in the response we have had for this training for the coming term in September.

It is recognized that the main drawback is that a man has to leave his job for 1 full year. This also is difficult for some States and impossible for others due to their limited budgets and/or lack of legislative authority.

In addition, in our review of the applications received for this coming year's program it is apparent that the States did not have many qualified personnel to participate in this program. We are doing everything we can to encourage better response as time goes on.

We are hoping to establish short-term courses in cooperation with

the U.S. Public Health Service. This approach may be attractive and feasible for some States.

We have conferred with USPHS in an effort to develop short courses. I would like to point out that our fellowship programs do not appear to duplicate in any way the form of education and training that is offered by the U.S. Public Health Service to State and municipal employees.

We hope that in the future fiscal years we will be able to provide at least 25 places each year for State personnel in our 12-month formal training program. In addition to the University of Michigan, Harvard is now establishing curriculums for this program and will take part this coming academic year. This question of training is not easy and results do not come quickly.

Gentlemen, this is a brief description of the inspection program for licensee activities controlled by the AEC. Our experience indicates to us we are headed in the right direction, but that we can improve in our methods and effectiveness of inspection. We believe the program we have been following has helped to avoid major radiation accidents, but we do believe that a sound inspection program that has the respect of the atomic energy industry can reduce the possibilities for such occurrences.

That completes my statement, Mr. Chairman.

Representing DURHAM (presiding). Thank you.

(Additional information on the AEC inspection program follows:)

ATOMIC ENERGY COMMISSION,
Washington, D.C., March 30, 1959.

Mr. JAMES T. RAMEY,
Executive Director,
Joint Committee on Atomic Energy,
Congress of the United States.

DEAR MR. RAMEY: In our report to the Committee in November 1958, on "Federal-State Relations in Regulating Radiation Hazards," we made a brief reference to cooperation with State inspection agencies with regard to inspection of AEC licenses (p. 21). This is to inform you that as a part of this program an informal arrangement has been made with the State of Connecticut whereby they will schedule inspections of byproduct material uses in hospitals and private medical practices (excluding teletherapy units) and sealed source gaging devices which are under AEC license. AEC will continue to inspect other licensed activities as it has done heretofore.

The inspections by the State of Connecticut will be conducted on the basis of State laws and regulatons which are comparable to AEC standards. A full exchange of inspection information will keep the respective agencies informed of the status of compliance of the licensees inspected. State representatives will continue to accompany AEC representatives on direct AEC inspections.

This arrangement will reduce the duplication of AEC and State inspection effort in the State of Connecticut. We believe also that combination of technical skills and manpower under this arrangement will provide more effective coverage of licensed activities in this State.

A member of the AEC Division of Inspection presented remarks concerning this program of cooperation with State agencies at the Atomic Industrial Forum Inc., conference in Columbus, Ohio in October 1958. A copy of these remarks is attached.

Should you desire further information concerning this program we will be glad to furnish it upon request.

Sincerely yours,

A. R. LUEDECKE, *General Manager.*

Enclosure: Summary of remarks by L. D. Low.

EXCERPT FROM JANUARY 1959 FORUM REPORT "THE IMPACT OF THE PEACEFUL USES OF ATOMIC ENERGY ON STATE AND LOCAL GOVERNMENT, PAGES 68, 69, AND 70

THE U.S. ATOMIC ENERGY COMMISSION INSPECTION PROGRAM

(Summary based on remarks presented by Lawrence D. Low, Inspection Specialist (Compliance), Division of Inspection, U.S. Atomic Energy Commission)

The materials inspection program is operated on a decentralized basis. Eight of the 10 Atomic Energy Commission operations offices have an inspection division and staff. Each of them has responsibility for a geographical area which consists of two or more States. All materials inspections are scheduled and accomplished at the field level. The priority and frequency of AEC inspections are directly related to the degree and the type of operation licensed.

Inspection staff

The Atomic Energy Commission inspection staffs throughout the country are composed of men who are professionals in the field of radiation control, who can assess the overall safety of a given operation or program and evaluate it in terms of Atomic Energy Commission standards and regulations. Their objective is to determine whether radiation control practices and procedures of the licensee are effective for protection of the health and safety of the public, which includes, of course, the licensee himself and his employees. Compliance with the regulations and licensed conditions are insisted upon, but, in addition, continued safe operations depend upon management interest and organizational discipline in the conduct of such operations This is true of the small as well as the large programs.

In addition, the Atomic Energy Commission must keep abreast of the need for changes, revisions, deletions, or additions to its regulations and licensing procedures. Part of this need is met by information gained through licensees' experience and gathered through the inspection process.

State cooperation

Cooperation with State governments on inspection matters is threefold:

1. The appropriate agency is informed of schedules for inspections and investigations, and State personnel are invited to accompany representatives;
2. Each State is furnished a copy of all Atomic Energy Commission licenses for use of materials in their State; and
3. Professional training is made available to State personnel in the field of radiation control.

The current programs of several States parallel that of the Atomic Energy Commission in many respects and, from the inspection standpoint, respective personnel have concurrent assignments in some areas.

Future cooperation

Some of the States now have registration requirements; laws and regulations for the control of radiation; enforcement procedures; inspection organizations; and technical inspection personnel. The Atomic Energy Commission program includes similar resources and functions with the exception of registration which, of course, is unnecessary in view of its program for licensing of materials.

Duplication of inspection effort certainly should be minimized if not eliminated altogether. The Atomic Energy Commission and those States that have radiation control laws, personnel, and organization, and are conducting inspections, should seek practical means to coordinate their respective programs. If the results of a State inspection and enforcement program are comparable to that of the Atomic Energy Commission for certain classes of federally licensed activities, the Atomic Energy Commission could adjust its direct inspection coverage to reduce duplication. The AEC and States could exchange information on results and, for the classes of licensees involved, the respective efforts would complement each other. The combined use of technical skills would certainly afford greater coverage of licensed activities and both programs would benefit.

Under current Federal legislation the Atomic Energy Commission has no authority to delegate or divest itself of responsibility for any group or class of licensed activities. However, if a given State and the Atomic Energy Com-

mission were cooperating on the above basis, both would know that certain licenses were being inspected and the exchange of information would keep the respective Governments informed as to the status of a licensee's compliance. Indeed, the mutual goal is control of radiation to assure the health and safety of the public. The AEC would like to explore the possibility of a cooperative arrangement with those States that have the prerequisite discussed.

Training programs

The Atomic Energy Commission now has a course which is known as special assistance in training for radiation control. For several years the Atomic Energy Commission has had a fellowship program for training college level people in radiological physics. The second program is in effect a modified fellowship program and is tailored to fulfill the needs of State people for academic training in the field of radiation control. A full year is required for this course and the stipend and allowance are the same as for the regular fellowship. At the present time the course is given at the School of Public Health at the University of Michigan. Other schools are under consideration. Academic credit is given for these postgraduate studies. Four State employees are now enrolled in the radiation control course for the 1958–59 academic year.

The Atomic Energy Commission local directors of inspection divisions will be forwarding announcements of the 1959–60 program for both the fellowship and special assistance programs to the States in their respective areas in the next couple of months. The AEC has budgeted for several additional appointments for the next academic year and hopes that some of the State agencies will be able to take advantage of this opportunity for further training of their people.

Mr. PRICE. I might say, Mr. Chairman, we have filed our statement for the record, which has been accepted, and in view of the hour, unless the committee has some questions, we have nothing further to add.

Representative DURHAM. Thank you. Who is your next witness?

Mr. GRAHAM. That is all we have, sir.

Representative DURHAM. We will now hear from Dr. David Price and Dr. Francis J. Weber of the Public Health Service.

STATEMENT OF DAVID E. PRICE, M.D., CHIEF, BUREAU OF STATE SERVICES, PUBLIC HEALTH SERVICE, ACCOMPANIED BY DR. FRANCIS J. WEBER

Dr. PRICE. Mr. Chairman, I have a statement which I would like to read to supplement the material which we have already submitted for publication in the volume of background materials.

Representative DURHAM. I think we will have time enough. Has Dr. Weber a statement also?

Dr. WEBER. No, sir.

Representative DURHAM. You may proceed, Doctor.

RESPONSIBILITY FOR HEALTH PROGRAMS

Dr. PRICE. Primary responsibility for protection of the public health in the United States is vested in the States. All the States and many of their political subdivisions have established public health agencies to discharge this responsibility.

The Federal Government exercises a limited regulatory authority in the health field. For the most part, it makes its contributions through programs designed to assist the States in carrying out their functions. These assistance programs include financial grants to stimulate and help support modern public health services, technical assistance, training, research, and the dissemination of information.

STATUTORY AUTHORITY OF THE PUBLIC HEALTH SERVICE

The Public Health Service works largely under the authority of the Public Health Service Act (42 U.S.C. ch. 6A), which provides broad authority to the Surgeon General. Section 301 of the act authorizes the Surgeon General, among other things, to conduct or support research, investigations, experiments, demonstrations, and studies relating to the causes, diagnosis, treatment, control, and prevention of physical and mental diseases and impairments of man. He is authorized by section 311 to cooperate with and aid State and local authorities in the enforcement of their health regulations and to advise the States on matters relating to the preservation and improvement of the public health. He is further authorized to cooperate with and render assistance to appropriate public authorities, scientific institutions, and scientists in connection with these activities.

Section 214 authorizes the Surgeon General to detail officers to State health authorities to assist them in prosecuting programs in public health, and also to detail officers to nonprofit educational, research, and other institutions engaged in health activities for special studies of scientific problems and for the dissemination of information related to public health. The loan of trained Public Health Service personnel to State agencies is a valuable means of assisting the States in the initiation of new programs. The statute provides for close working relationships, not only with official health agencies through a Conference of State and Territorial Health Officers, established by section 312, but also with health scientists outside the State and Federal Governments through the National Advisory Councils established by section 317. Section 314(c) authorizes assistance to States and political subdivisions, by means of grants and otherwise, including grants for demonstrations and for training of personnel, to establish and maintain adequate public health services.

Under section 313, the Surgeon General is authorized to collect and compile statistics on mortality and morbidity. Finally, section 315 authorizes the Surgeon General to publish or otherwise issue information on public health for the use of the general public and for persons in institutions engaged in work related to the functions of the service.

The Public Health Service Act does not enumerate all the physical and mental diseases and impairments of man, or all the means of diagnosing or treating them, with respect to which the Service is authorized to conduct this range of activities. Radiation is therefore not specifically mentioned, but as a cause of important diseases and impairments of man on the one hand, and as a means of diagnosis and treatment of disease on the other, these aspects of radiation are as clearly encompassed within our statutory mission as is any other public health problem.

Two other laws extend the authority of the Public Health Service in fields concerned with radiological health. Under the provisions of the Federal Water Pollution Control Act (33 U.S.C. 466), the Surgeon General may take certain actions in connection with interstate water pollution. He is authorized to conduct research, investigations, experiments, demonstrations, and studies relating to the causes, control, and prevention of water pollution; to cooperate with and render assistance to appropriate public authorities, agencies, in-

stitutions, as well as private agencies and institutions, for the same purposes; and to make grants to State and interstate agencies to assist them in meeting the costs of adequate measures for the prevention and control of water pollution. He is authorized to take measures, with the cooperation of the State authorities, for the enforcement of the abatement of interstate water pollution.

The second specific authority is conferred by the Air Pollution Research and Technical Assistance Act (42 U.S.C. 1857). The Surgeon General is authorized to develop or recommend programs or methods for eliminating or reducing air pollution. He is also authorized, among other things, to encourage cooperative activities by State and local governments for the prevention and abatement of air pollution, and to make grants to State and local governmental air-pollution-control agencies, and to other public and private agecnies and institutions, or to individuals for research, training, and demonstration projects, or to enter into contracts for such projects.

SOURCES OF RADIATION EXPOSURE

Health authorities have given some attention to radiation hazards for many years. However, only a very small group in the population was considered to have significant exposure. These individuals comprised the radiologists, radiological technicians, radium watch dial painters, patients receiving X-ray or radium therapy, and workers in some mines. The extent of the problem did not appear to merit much serious attention.

With the rapid development of nuclear energy, it has become apparent that opportunities for exposure will increase. It is therefore prudent to take every feasible step to reduce unnecessary exposure from every controllable source of radiation.

The widespread public interest focused on radiation in recent years has been directed primarily toward radiation from nuclear power reactors, nuclear weapons, and radioactive isotopes. This helps create the impression that radiation is something new. As a result, the fact that radiation has always been a part of man's environment is frequently obscured. This natural background radiation arises from cosmic rays impinging on the earth's atmosphere from outer space and from naturally occurring radioactive materials in the earth, water, and atmosphere as well as within the human body.

It is only in recent years that the potential hazard of low-level exposures has been recognized. Previously, it was felt that relatively high exposures were necessary in order to produce deleterious effects. Now it has become apparent, particularly in the case of the genetic effects of radiation, that any exposure, however small, is accompanied by a potential hazard. Thus, for these reasons, and with the increasing population exposure to incompletely controllable sources, attention must be devoted to these sources for which effective control measures are currently available. Since the number of controllable sources is also increasing rapidly, the problem of control merits early, more vigorous attention.

RESPONSIBILITIES OF STATE HEALTH AGENCIES

As indicated above, the primary responsibility for health protection rests within the States. It is, therefore, essential that radiological health programs be developed within the State health agencies. These programs should contain the following elements:

1. Data collection: The State health departments, through already established mechanisms, can aid in the accumulation of biological as well as physical data for use in setting operational standards. The recently reported study in New York State of the relationship between higher than average levels of natural background and the incidence of certain congenital abnormalities is one example of the use of data most readily available to State health agencies. Because of the large scale of necessary population studies, it is most important that all of the existing facilities for data collection be utilized to the fullest degree.

2. Monitoring and surveillance: Programs should be established for the careful monitoring of the levels of radioactivity within the various environmental media. Efforts in recent years have included cooperative projects between the States and the Public Health Service. Some of these are (*a*) an air pollution network to gather data on the levels of various air pollutants, including radioactive materials; (*b*) a radiation surveillance network to supplement the air pollution network by gathering data specifically on radioactivity in cooperation with the AEC; (*c*) a water quality network in which water samples are taken at various sites throughout the country and analyzed for various pollutants, including radioactive materials; and (*d*) a milk surveillance network to determine levels of specific radionuclides in selected milksheds throughout the Nation. Primary emphasis in these monitoring and surveillance activities should be the provision of data potentially useful as a basis for control measures.

3. Control of radiation sources: We believe it is important that exposure of the population to radiation be reduced insofar as practicable. At the present time one of the most fruitful areas for effort by health agencies is in the exposure to X-rays. Techniques are available by which the amount of radiation exposure which we all receive in various diagnostic procedures, for instance, can be reduced without adversely affecting their diagnostic value. Cooperative activities between the State and local health agencies and practitioners who use X-rays can result in a wider application of these exposure reducing techniques. Professional societies have taken the initiative in this problem and will welcome the work of health agencies to extend the most modern protective practices.

4. Public education: There is a great need for education of the public about radiation and the effects of exposure. Traditionally, people have turned to their State and local health agencies for information concerning potential hazards to their health. Health departments must be in a position to provide accurate and understandable information to serve as a basis for intelligent action on the part of the public. The development of the nuclear energy program may be seriously impaired by public fear of radiation hazards. We believe the public can be most confident if informed and reassured by the health authorities most directly concerned with their health status.

THE ROLE OF THE PUBLIC HEALTH SERVICE

The Service's role in radiological health is not fundamentally different from its role in dealing with other health problems. Since the ultimate responsibility for most aspects of health protection is vested in the States, the Public Health Service functions in cooperation with the State agencies in the stimulation and strengthening of programs in radiological health. To further this effort the Public Health Service operates through eight regional offices located in New York City, Charlottesville, Va., Atlanta, Chicago, Kansas City, Dallas, Denver, and San Francisco. At the present time the Division of Radiological Health has specially trained personnel in two of the regional offices and has given supplemental training to personnel in other regional offices.

A very effective mechanism for the assistance in the development of radiological health programs within State health agencies is the direct detail of specially trained Public Health Service personnel to participate directly in the development of these programs. The loaned individual not only assists in the carrying out of the program during his assignment, but also helps train State personnel who will carry on the program at the termination of the Public Health Service officer's assignment. In many instances the presence of the Public Health Service officer within the State permits the State to release one of its own personnel for graduate training in radiological health. At the present time trained Public Health Service officers are assigned to the States of Oregon, Texas, Minnesota, and Michigan.

Consultation on specific problems is another mechanism by which the Public Health Service assists the States. The close relationship existing between the staff of the State health agencies and the Public Health Service regional offices permits this consultation to be carried out in the most effective way. This frequently serves to stimulate and promote more effective programs and services within the State. An example of this type of operation occurred recently as a result of a request from the State board of health in Florida. The Dade County Medical Society (Miami) had requested the State board of health to survey all of the medical X-ray units in use in that county. At the request of the Florida State Board of Health the PHS sent in a team of two trained specialists to help initiate the survey, to develop the procedures and methods of operation, and to provide on-the-job training to the State health department's personnel who would continue the survey. In this way an important program in radiation safety of X-ray machines has been initiated within the State of Florida.

Representative DURHAM. Is that the first time that there has been such a request or has it been made before?

Dr. PRICE. Do you know the answer to that question, Dr. Weber?

Dr. WEBER. No, sir; it is not the first time. Actually, technical assistance on X-ray operations has been given to other States and counties in the United States. Some of the States are listed in the green book.[1]

Representative DURHAM. Have the States been making a survey of the use of these instruments?

[1] Pp. 73–101, inclusive, "Selected Statements on Federal-State Cooperation in the Atomic Energy Field," Joint Committee on Atomic Energy, 86th Cong., 1st sess. (March 1959).

Dr. WEBER. In certain situations that is true. For example, in Colorado, the State health department assisted the county of Boulder, north of Denver, to make a complete survey.

Representative DURHAM. In other words, the States have full authority to do it if they want to initiate and carry out a full inspection, if they have the qualified personnel to do it? Is that true?

Dr. WEBER. Yes, sir; that is correct. It comes within their province.

Representative DURHAM. It does not have to be done by any action in Washington?

Dr. PRICE. No, sir.

Representative DURHAM. I think that is fine. The responsibility to a large degree is up to the local community where the public health setup is located. I think in my State we have one in every county, as I recall. There may be one or two counties that do not have it.

Dr. PRICE. The Public Health Service is also participating in the development of the mutual assistance arrangements that Dr. Durham described.

Representative DURHAM. All States at the present time are participating in the public health program. That is correct, is it not?

Dr. PRICE. Yes, sir.

Representative DURHAM. You do have a large number of counties that do not have a public health setup?

Dr. PRICE. There are many counties in the United States that do not have organized public health services; yes, sir. Some of those are covered by services directly from the State level.

Representative ASPINALL. Mr. Chairman, may I ask a question there to follow through? When the Public Health Service does go into the State or go into the county, does it go in of its own authority or does it go in to cooperate with the State or the counties?

Dr. PRICE. No, sir. I goes in only at the request of the State, and on the authority of the State. The Public Health Service has no authority of its own to do other than cooperate with and assist the State in these matters.

Representative ASPINALL. To take care of the pollution system in intrastate streams, then, you go in only at the request and authority of the State?

Dr. PRICE. That is correct, if it is an intrastate stream rather than an interstate stream.

Representative DURHAM. May I ask a further question, Doctor? Of course, you have several public health schools at the present time. I know you have one at Chapel Hill. Do these schools participate in this program to any degree with regard to radiation hazards? Is there any training going on in this field directly in the public health schools?

Dr. PRICE. Yes, there is some training going on in some of the schools. One of the things which we are very anxious to see developed is a greater program of training in this regard.

Representative DURHAM. Were there any funds this year in the public health funds? We just recently passed the funds for the public health setup. Were there any funds asked for this year or were there any funds put in for such a training program?

Dr. PRICE. There are no funds specifically requested for a training program of this kind. There are two mechanisms by which the Public Health Service may assist in the development of this type of activity. One is through the provision of training grants to individuals to go to these schools for training.

Representative DURHAM. You have had that for many years.

Dr. PRICE. This is something which we have had for several years. The other is a program which was newly authorized last year, and for which there are funds in the supplemental appropriation act for the current fiscal year in the amount, I believe, of $450,000, for grants to the schools of public health for enrichment of their curriculum. This is not specifically earmarked for the development of programs in radiological health, but it would be available to the schools for this purpose if they should choose to use it that way.

Representative DURHAM. I should think that this would be a field that you would be looking at very carefully and training personnel just for that type of work.

Dr. PRICE. We are very much interested in that possibility, Mr. Durham.

Representative DURHAM. I think the sooner we can let the public know and let them be aware of the fact that we are not trying to do something about it from the standpoint of these agencies, the better.

Dr. PRICE. Yes, sir.

Representative DURHAM. You may proceed, Doctor.

Dr. PRICE. Analogous technical consultations have been carried on in other States.

When a nuclear weapon was accidentally dropped near Florence, S.C., the South Carolina State Board of Health requested the Public Health Service's assistance in the evaluation of this accident. A Public Health Service team consisting of a health physicist and a trained medical officer was rushed to the scene. Urine specimens, as well as environmental samples, were taken to determine the presence or absence of radioactive contamination. Fortunately these analyses demonstrated that no radiation hazard had occurred as a result of this accident. This incident demonstrates the technical assistance available to the State health department through a familiar working relationship applied daily in dealing with other health problems.

The training of personnel for activities in the radiological health program is an activity to which the Service has directed increasing attention. The Service in recent years has been providing advanced academic training for selected personnel within the Service. The major objectives of the current training effort of the PHS are fourfold:

(1) short courses for the training of State and local health agency personnel;

(2) training of PHS staff to conduct the radiological health program activities;

(3) assistance in the training of technical personnel in other public agencies as well as in industry; and

(4) encouraging schools of medicine, dentistry, engineering, public health, and physical sciences to incorporate radiological health in their curriculums.

In recent years the Public Health Service has developed an effective Radiological Health Training Section at the Service's Sanitary Engineering Center at Cincinnati, Ohio. This year 18 resident training courses were presented at Cincinnati in the special fields of basic radiological health, occupational radiation protection, detection, and control of radioactive pollutants in air and water, sanitary engineering aspects of nuclear energy, environmental health aspects of nuclear reactor operation, radiological defense monitoring, and radiation protection aspects of tuberculosis X-ray case finding.

Representative DURHAM. Is that in cooperation with the Taft Foundation?

Dr. PRICE. This is carried out at the Taft Sanitary Engineering Center, sir.

Representative DURHAM. In cooperation with the Public Health Service?

Dr. PRICE. It is a unit of the Public Health Service. We operate that center. It carries out these training activities for our Division of Radiological Health.

Representative DURHAM. It is operated entirely by funds from the Public Health Service?

Dr. PRICE. Yes, sir.

The list of these courses indicates the scope of the radiological health activities with which public health workers are concerned. Other courses given at the Sanitary Engineering Center, primarily for workers in milk and food sanitation programs and water supply and water pollution control programs, also include material on radiological health.

As has been indicated above, under the provision of section 314 of the Public Health Service Act grants are allotted to States on a formula basis. States use these funds to assist political subdivisions in establishing and maintaining adequate public health services. Grants are also utilized for demonstration projects within a State or locality and for the training of personnel for State and local health work. This is a mechanism available to the Public Health Service to assist States in the development of radiological health activities such as outlined above.

It has previously been mentioned that State and local public health organization provides a valuable resource for the collection of biological and physical data needed to evaluate health effects and for other research purposes. Mention has been made of the New York State study of congenital malformations related to variations in natural background. Such studies could be extended to other geographic areas and the results coordinated so as to amass statistically significant data and explore other possible explanations for the malformations observed.

The Public Health Service can assist in the gathering and evaluation of such data. Large scale studies of population groups with various kinds and degrees of exposure have been recommended. A coordinated plan carried out through the State and local health agencies would be an effective mechanism to secure this data.

Considerable attention in recent months has been directed to the question of standards of radiation exposure. This is a highly technical problem. Analysis of scientific data from the fields of physics,

biochemistry, pathology and genetics and correlation between physical measurement and biological effects is a first step. Standards to govern industrial activities and public health practices must be based on the best information available as a result of this step. From a practical point of view, these standards must provide a guide to administrative action to reduce exposure from sources which may be subjected to technological control methods.

The objective, therefore, is control measures since the establishment of some numerical standard is somewhat academic in the absence of effective programs to attain the standard. Here there is a need for a coordinated approach to insure a desirable degree of uniformity in standards suitable for application in occupational health and public health work.

We believe the Public Health Service can assist in achieving this uniformity by working with authorities in the field as we have in the past in developing such standards as the drinking water standard and the standard milk ordinance and code which are widely used throughout the United States.

THE PROPOSED AMENDMENT TO THE ATOMIC ENERGY ACT OF 1954

I have outlined briefly the views of the Public Health Service as to the role of States and the Federal-State relationship in the field of radiological health insofar as the Service is concerned. It is apparent that much needs to be done to develop programs at State level to fully assume this role. We believe the Public Health Service should use its existing authority to help the States develop their programs and improve the competence of personnel to carry them out.

Because of the Atomic Enrgy Act, there now exist questions as to State authority and responsibility to deal with radiation hazards potentially arising from AEC-regulated materials or installations. We believe clarification of these questions would offer encouragement to development of fully effective State health activities in the radiation field.

I am glad to note that the legislative proposals submitted to your committee by the Atomic Energy Commission recognize the interests of the States in this field and offers means for the development of State competence and for the progressive relinquishment of the Commission's regulatory responsibilities for radiation protection on a selective basis where State programs are adequate.

Our Department is now preparing a report to your committee on this proposal, which will include a discussion of possible alternative approaches to the objective of the bill.

Representative DURHAM. Doctor, that is an excellent statement. It is quite obvious you have put a lot of time into it.

When do you expect to have the recommendations before the committee?

Dr. PRICE. I am sorry, sir, I cannot predict when that may be.

Mr. RAMEY. It would be helpful by the end of the week in connection with our discussion of the organizational situation.

Dr. PRICE. I appreciate that, sir. I am not sure that I will be able to promise to fulfill that expectation.

Representative DURHAM. I see you have a little concern here as to the AEC and the part you will play in the field in cooperation with the

States. I feel encouraged that can be worked out in an agreeable manner because we are all in this to do the best job we can. I certainly hope the two agencies of the Government will not get into a conflict here as we do up here in Congress over jurisdiction, because this problem is too serious to delay.

Dr. PRICE. I think we do not have any serious concern about this. We see an adequate job to require all of the resources that we can possibly muster.

Representative DURHAM. I think you are right in that objective. I felt that you people should play a large role in this matter in the future. It is well set up and well operated at the present time throughout the country. It is well known and people have a high respect for you.

Mr. Ramey, do you have some questions?

Mr. RAMEY. How many people does the Public Health Service have in its radiological work, and how much money is being budgeted for current fiscal 1959 and fiscal 1960?

Dr. PRICE. The amount of money which we have budgeted specifically for our radiological health activity in fiscal 1959 is $634,000. There are 76 positions related to this fund. We have before the Appropriations Committees of the Congress at the present time the President's request for $1,439,000 for fiscal 1960. This will represent an $805,000 increase in the activity.

Mr. RAMEY. Does the Public Health Service have much experience in the field of regulating health activities as against its role of cooperation with the States in connection with educational means of accomplishing its objectives? I notice you do mention the stream pollution situation. On interstate streams do you have the authority to establish regulations and to enforce them?

Dr. PRICE. The authority which the Public Health Service has with respect to interstate streams is contained in the Water Pollution Control Act which is Public Law 660 of the 84th Congress. It provides quite clearly, the congressional policy, that the responsibility for stream pollution lies with the States. In carrying out his responsibility for the abatement of interstate stream pollution the Surgeon General is required to go through a rather lengthy series of procedural steps that are designed to protect the rights and responsibility of the States. However, having gone through the necessary investigation and hearing procedures which are initiated at the request of one of the States involved, the Surgeon General is authorized, or rather the Secretary of the Department of Health, Education, and Welfare, is authorized to set up a hearing board and conduct hearings on the pollution situation, outline remedial measures, and then if in a reasonable length of time action has not been taken, and again at the request of one of the States involved the Service may initiate abatement action in the courts.

Representative DURHAM. The courts have upheld that?

Dr. PRICE. Yes, sir.

Mr. RAMEY. I believe there was a case mentioned a month or two ago.

Dr. PRICE. There has been, I believe, only one case carried to this length, and that dealt with the pollution by salt brine from oil drilling operations in Corney Creek, Ark.

Mr. RAMEY. As a part of this pollution aspect, could that include radioactive wastes?

Dr. PRICE. We interpret it to include radioactive wastes; yes, sir.

Mr. RAMEY. So you could follow this procedure with respect to interstate streams?

Dr. PRICE. This is, as a matter of fact, the procedure which is being followed in connection with the Animas River which was mentioned earlier this afternoon.

Mr. RAMEY. That is in connection with the milling and mining operation?

Dr. PRICE. Yes, sir.

Mr. RAMEY. I notice in your statement you mention that the Public Health Service in cooperation with the States has developed drinking water standards and milk ordinance standards.

Do you think it would be possible to develop or adopt radiation standards for either general application or for adoption by the States?

Dr. PRICE. I think it is a possibility. I would like to comment further about that in this way: When one comes right down to the facts of the matter, the best one can do is to to adopt the best scientific advice that can be had.

In the case of the drinking water standards and the milk ordinance and code to which I referred as examples, the Service operated to bring together the best authorities it could recognize in those fields and utilize the opinions which they gave.

Representative DURHAM. You are going to have to be guided by the experts.

Dr. PRICE. One is going to have to be guided by the experts, however this is done. I did not mean to imply in that that we considered that we had any more ability to do this job than anyone else.

Mr. RAMEY. Do you think it would be desirable in that connection to develop standards on the use of X-rays, medical and dental? Testimony today has brought out that entirely apart from the Atomic Energy Commission's jurisdiction there is this field of medical and dental X-rays that apparently is probably the leading source of radiation which is presumably subject to State regulation if the States were so inclined, but apparently is one where possibly the greatest abuses occur. Has the Public Health Service made any great surveys of that or proposes to do anything about that? You mentioned the Florida example.

Dr. PRICE. Yes. The Public Health Service has given considerable attention to this problem. I think there is an area of proper regulatory responsibilities for States in this field. It was brought out in the testimony earlier this morning that one has to rely on the judgment of the practitioner in the use of radiation in diagnosis and treatment. I would agree with this statement.

However, outside the realm of his professional judgment there is the question of the condition of his equipment and the way in which it is regulated and protected.

I believe that it is quite feasible to institute measures to be certain that there is not unnecessary exposure which does not contribute to the physician's objectives.

Mr. RAMEY. There is a good deal of evidence, is there not, that one of the causes of overexposure is poor and old-fashioned equipment?

Dr. PRICE. I have heard some of the experts in this field state that; yes, sir.

Representative DURHAM. Thank you very much, Doctor. We appreciate your statement.

Dr. PRICE. Thank you, sir.

Chairman ANDERSON. If you can get your recommendations up here as soon as possible, it would help us in getting this bill out.

Dr. PRICE. I will report your desires.

Representative DURHAM. The committee is adjourned and we will meet in the morning at 10 o'clock in this room.

(Whereupon, at 4:25 p.m., Tuesday, May 19, 1959, the committee recessed, to reconvene at 10 a.m., Wednesday, May 20, 1959.)

FEDERAL-STATE RELATIONSHIPS IN THE ATOMIC ENERGY FIELD

WEDNESDAY, MAY 20, 1959

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D.C.

The committee met, pursuant to recess, at 10 a.m., in room P–63, the Capitol, Representative Carl T. Durham presiding.

Present: Senators Anderson, Dworshak, and Bennett; Representatives Durham, Price, Westland, and Aspinall.

Also present: James T. Ramey, executive director; David R. Toll, staff counsel, Joint Committee on Atomic Energy.

Representative DURHAM. The meeting will come to order.

The Joint Committee on Atomic Energy is continuing public hearings today on Federal-State relations. This morning we are privileged to hear from Governor Smylie of Idaho, who will testify concerning the report of the Joint Federal-State Action Committee.

We are glad to have you with us this morning, Governor, and you may proceed in your own way.

Governor SMYLIE. Thank you, Mr. Chairman.

Representative DURHAM. I might say your State is well represented on this committee by a friend of mine for the past 21 or 22 years. We are certainly glad to have you here this morning. Senator Dworshak.

Senator DWORSHAK. Mr. Chairman, as a member of this committee I am very happy to hear the testimony of our Governor, Governor Smylie of Boise, Idaho. He has been very active as one of the leaders in the Conference of Governors, and I am sure he will have a very informative message for us this morning.

Representative DURHAM. I might also say that this committee has a deep appreciation for the State, because of the fact that some of the finest research facilities in the entire country are located in your State.

Governor SMYLIE. Thank you, sir.

Representative DURHAM. You may proceed, Governor.

STATEMENT OF HON. ROBERT E. SMYLIE, GOVERNOR OF THE STATE OF IDAHO

Governor SMYLIE. Mr. Chairman, my name is Robert E. Smylie. I am Governor of Idaho, chairman of the Governors' Conference Special Committee on Federal-State Relations and cochairman of the Joint Federal-State Action Committee.

Mr. Chairman, as you know, the States and their political subdivisions have a vital interest in the development and regulation of

atomic enterprise. Because of its singular history, however, there was almost no basis for State activity in this field prior to the enactment of the Atomic Energy Act of 1954. Since then, although the States recognize the growing importance of these energy sources for the continuing process of the American economy, the increasingly widespread use of radioactive materials in industry, agriculture, medicine, and research has become a source of concern to State and local government personnel responsible for protection of the public health and safety.

Very early in the day the chairman and vice chairman of this committee recognized the interest and concern of the States and their traditional responsibility for protection of the public from hazards to health and safety. In the 84th Congress, Mr. Durham introduced a bill authorizing and directing the Atomic Energy Commission to cooperate with the States in the formulation of standards for regulating health and safety aspects and to relinquish jurisdiction in any portion of the health and safety aspects of the AEC regulation 6 months after receiving a certificate from the Governor of any State that it had an agency competent to regulate such aspects.

In the same Congress, and again in the 85th Congress, Senator Anderson submitted a bill to authorize the Commission to cooperate with the States in the formulation of standards regulating the health and safety aspects and other aspects of the atomic energy field; to negotiate compacts or agreements with States relating to health and safety aspects of the atomic energy program prior to their submission to Congress for approval; and to participate in conferences with State representatives respecting State-Federal agreements or uniform State laws. Under the bill, an agreement could provide for delineation of responsibility between the Commission and a State with respect to health and safety aspects of licensed activities and the Commission's turning over to a State areas for regulation as it found the State competent to assume such powers.

In June 1957, the Atomic Energy Commission forwarded to this committee a proposed bill which would have authorized the States to enforce radiation safety standards not in conflict with those of the Commission. It would have prohibited State licensing of activities licensed by the Commission and the application of State radiation standards to facilities operated by the AEC or under AEC contract. It would have permitted the utilization of State personnel in the performance of inspections or other services for the Commission and the provision by the Commission of training for State employees.

Mr. Chairman, when in 1957 the Joint Federal-State Action Committee was formed, a major agenda item was atomic energy. The committee considered this subject in the light of its responsibilities to designate functions which the States are ready and willing to assume and finance—functions that are now performed or financed wholly or in part by the Federal Government—and to identify functions and responsibilities likely to require State or Federal attention in the future, and to recommend the level of State effort, or Federal effort, or both, that will be needed to assure effective action.

In reaching our recommendations for action we attempted to assess such factors as the traditional State responsibility for protection of the public health and safety; the peculiar history of atomic energy

development; the state of current knowledge; the nationwide shortage of trained personnel; the variable impact of the industry on the States; and, of course, the legislation that had been proposed. Ultimately, in reporting to the President and the chairman of the Governors' conference, we reached the following conclusions.

The Joint Federal-State Action Committee agrees that a greater share of the responsibility for the promotion and regulation of the peacetime uses of atomic energy, particularly in the fields of health and safety, should be vested in the State governments.

The Joint Federal-State Action Committee recommends that the President urge Congress to amend for the present the Atomic Energy Act of 1954, which amendments should—

1. Recognize that the States have authority to protect the public health and safety and that cooperation is essential between the States and Federal Governments in the development of health and safety standards pertaining to the use of nuclear materials.

2. Include a specific statement recognizing the power of the States to adopt, inspect against, and enforce standards, not in conflict with those adopted by the Federal Government, for the protection of the public health and safety.

3. Authorize Federal-State agreements under which the States involved would assume, on behalf of the Federal Government, responsibilities for inspection of facilities and other appropriate functions within their States.

4. Specifically authorize Federal agencies to provide, with State financial participation, necessary training to State personnel in order to enable the States to render inspection and other services contemplated. Under this proposal the States would pay the salaries and expenses of State employees while in training in facilities and programs provided by Federal agencies.

Mr. Chairman, the Joint Action Committee's recommendations on broadening the powers of the States in the control and development of peaceful uses of atomic energy were accepted by the President and the Governor's Conference. In his letter of May 13, 1958, to the Speaker of the House of Representatives, the President stated that the Chairman of the Atomic Energy Commission would suggest appropriate revisions in the language of the bill submitted to this committee in June 1957. That action has been taken and I understand that your committee is now considering a new bill proposed by the AEC, one which, in our view, meets fully the recommendations of the Joint Federal-State Action Committee.

Subsection a of the bill recognizes State interest and responsibility in this field, particularly with respect to protection of the public from radiation hazards. Reference is made to Federal-State cooperation in the control of radiation hazards in this subsection, but subsection g is more specific concerning cooperative development of standards for protection against radiation hazards.

Subsection b(1) accords to a State the authority to effectuate health and safety protection standards in areas covered by a Federal-State agreement. Subsection d describes the mechanics and conditions of such agreements. Together, these subsections meet our second and third recommendations.

Our fourth recommendation is met by subsection h, which authorizes the Commission to provide training and other assistance to employees of any State or political subdivision thereof or group of States. This subsection also authorizes the use of agreements under which a State or group of States could perform inspection or other functions on a cooperative basis with the Commission, thus providing another means of assisting States to prepare for extending their responsibilities.

Mr. Chairman, if I may, I should like to comment briefly on three other subsections. Subsection i, on its face, seems to reflect a lack of faith in the States. We realize, of course, that, given the current state of the art, some startling development might require the termination or suspension of an agreement. We feel, on balance, that this subsection is probably not necessary but we are willing to abide by a congressional determination of the necessity or desirability of its inclusion. We would suggest, however, that, if it is retained, the authority of the Commission to terminate or suspend an agreement be limited to a certain period—possibly 5 years from the date of enactment.

Subsection j is designed to insure that no AEC licensee may claim that, by virtue of his license, he is not required to conform to State and local regulations for purposes other than protection against radiation hazards. Despite the contentions of some AEC licensees, the Congress did not intend, nor does the Commission contemplate, that the Atomic Energy Act of 1954 extend to such a thing as elevator inspections, to name one example. However, to clarify the meaning of the subsection, we would suggest the insertion of the words "subject to the Commission's regulatory authority" following the word "activities."

Subsection k is meant to acknowledge the interest of the States in the areas that the bill proposes remain under Federal jurisdiction. While a major purpose of the bill is to provide for a division of resonsibility, this subsection recognizes that power is not exercised in a vacuum. I might add that the subsection, in part, codifies what is Commission practice.

Mr. Chairman, we submit that the proposed bill provides a reasonable sharing of responsibility in this field while, at the same time, it makes possible continuing cooperation among the several levels of government. We believe that the agreement procedure provides the necessary flexibility to permit each State to assume such share of jurisdiction as its capabilities permit. Gradual enlargement of State capabilities will be possible under the bill's provisions relating to training of State employees and inspections in cooperation with Federal personnel. We believe that the enactment of this bill will make possible the utilization of State and local government employees in regulating the activities of several thousand users of radioactive isotopes, thereby relieving Federal personnel from what is essentially a local responsibility and permitting them to concentrate on areas of greater hazard.

The proposed bill was drafted by the AEC. It has been reviewed carefully by the State of the Council of State Governments and by a large number of State officials whom the council called upon for advice and consultation. Finally, it has been considered and endorsed

by the Joint Federal-State Action Committee. We hope this committee and the Congress will consider it favorably.

Mr. Chairman, may I say in conclusion that we are aware that there has been introduced a bill which would give to the U.S. Public Health Service and local health authorities primary responsibility for protection of the public health from radiation hazards. We do not wish to comment on this bill because we feel that the allocation of Federal responsibility among one or more agencies is essentially an internal Federal question. We do believe, however, that the bill before this committee, the bill submitted by the Atomic Energy Commission, represents a reasonable, practical division of jurisdiction between the Federal Government, on the one hand, and the States and their political subdivisions, on the other. We believe that the major provisions of the bill are workable no matter what Federal agency or agencies Congress decides shall exercise Federal responsibility in this field.

Mr. Chairman, I should like to express my gratitude to you and to the members of the Joint Committee on Atomic Energy for having been given this opportunity to express the views of the Joint Federal-State Action Committee and the special committee on Federal-State relations of the Governors' conference.

Representative DURHAM. Governor, that is an excellent statement and a very clear explanation of the bill. In fact, the best we have had before the committee up to the present time.

There are one or two things that are worrying me, and that is the fact, looking back over the growth of this entire industry, it has not been an easy job for us to sit here and try to put it in our economic life because it is something new and different from what we have faced before. I am glad to see that the conference has come out with an agreement as to the fact that we must do something. The industry is growing all the time, and we are all aware.

I might say that subsection (i) worried me a little bit, too. You say it indicates that it is a lack of faith, which I would not like to express, in Federal law, because I have a high respect for our States and I have always felt that way. I think we can probably cure the little points which you bring out here. We certainly appreciate your bringing them to our attention.

I might say that the U.S. Public Health Service has very broad jurisdiction in cooperation with the States. The AEC, being the prime producer of this material at the present time, has a responsibility also. I hope we can work it out so that the two agencies will cooperate fully in carrying out the law and also in carrying out their functions with respect to the hazards from radiation in order to protect the public health.

Looking at it from the point of view of their personnel and their operation at the present time, they do have a setup which is very favorable with respect to carrying out the intent of the law. As I have said, I believe it can be worked out if the two agencies cooperate, without too strict statutory language.

Governor SMYLIE. That is correct.

Representative DURHAM. Senator, do you have any questions?

Senator DWORSHAK. Yes. Mr. Chairman, I should ask permission to submit for the record a letter to Chairman Anderson from Dr. T. O. Carver, administrator of health of the State of Idaho, dealing with

this subject. I should like to ask the Governor if he has any comments to make on the contents of this letter.

Representative DURHAM. That may be inserted in the record at this point.

(The letter referred to follows:)

STATE OF IDAHO,
DEPARTMENT OF HEALTH,
Boise, Idaho, February 18, 1959.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States, Washington, D.C.

DEAR MR. ANDERSON: The Honorable Robert E. Smylie, Governor of the State of Idaho, has asked me to respond to your letter of February 16, 1959, regarding the public hearings the Joint Congressional Committee on Atomic Energy plans to hold this coming year.

We, of course, are very much interested in the atomic energy field especially as this has to do with radioactive waste disposal. The Idaho Board of Health on August 4, 1958, adopted its first regulations having to do with radioactivity. In the hearings held before these regulations were adopted it became evident that there is a conflict of opinion between State and Federal authorities.

We felt, as the public health agency for the State, we had primary responsibility for control of the environment as it concerned radiation. The opposite viewpoint we felt was expressed by the members of the Atomic Energy Commission. In some respects this became a question of the State's authority within its own borders to control environmental safety. The viewpoint expressed by Federal authorities was that the needs of the Nation required authority and control on a Federal level. We did not agree to this at the time nor do we think we will ever be able to agree to this premise.

In our relationship with the Atomic Energy Commission we have been led to believe that the State need not concern itself with atomic energy installations nor their operation. We think this is wrong. Because work in environmental sanitation is a very important part of our activities, we believe that we have knowledge and skills in this field that no one else has. In addtion, we feel that the State legislature has given us primary responsibility for the protection of the environment and we do not believe that we have been given any authority to delegate this responsibility to the Atomic Energy Commission or to the Federal Government. We intend to proceed on the assumption that we do have primary responsibility for protecting the environment especially as it concerns water and air until perhaps by court decision we are proven to be wrong in our assumption. I have mentioned all this because I hope from your committee meetings may come clarification of areas of responsibility.

As you know, the Atomic Energy Commission has an installation at Arco, Idaho. Our main apprehension concerning this installation is, of course, radioactive waste disposal. We have been especially concerned in this unit's disposal of radioactive waste materials by use of underground streams. We believe that we are correct in our position that underground waters should not be used in underground waste disposal. We have taken a stand on perhaps somewhat shaky ground that in Idaho no one knows exactly what eventually happens to these underground water supplies. We think our position is stronger, however, than that of the Atomic Energy Commission which apparently assumes that if the final fate of these waters is unknown, using them as a sewer is permissible.

We would appreciate being kept informed of the deliberations of your committee. If we can be of any possible assistance, please let us know.

Sincerely,

T. O. CARVER, M.D.,
Administrator of Health.

Governor SMYLIE. Senator, I am aware of the contents of Dr. Carver's letter. For the record, Mr. Durham, Dr. Carver is the administrator of our State board of health in Idaho, and as such, the chief executive officer of our Division of Public Health Services. He expresses some concern in this letter with respect to the manner in which waste matter from the Commission's installation at Arco, Idaho, has been handled.

I think I could say with all deference to Dr. Carver that I think his position is one of not being sure, and he being a scientist charged with the public health responsibility wants to be sure where these radioactive wastes are going in the underground water supply in the area. I think I can say, and this committee probably knows, that this is a matter which has had wide study by the Commission and by other people, and there is no visible evidence or no understandable evidence of any danger from this at the moment.

I do think that the doctor's letter makes a good case for the proposals contained in this bill. In other words, if we had a shared responsibility in this field, I believe that the Commission's work and the work of our people at the State level, who are charged with responsibility for the public health and safety, would be enhanced if there were a statutory framework within which they could conduct their joint responsibilities.

Representative DURHAM. We have a copy of Dr. Carver's letter which came here on February 18, which I read, and which expresses some concern.

Senator DWORSHAK. Governor, the Idaho Operations Office at Idaho Falls has a tremendous responsibility in directing the development of the reactor installation in our State. Have you had any difficulty at any time insofar as the State's responsibility may be concerned in maintaining safety regulations and in having an opportunity to advise the Idaho Operations Office on any matters which may have been of particular concern and interest to the people of that section of our State?

Governor SMYLIE. I don't believe we have had any difficulty. As a matter of fact, I am most happy to say that the Commission's personnel and the Commission itself in its operations at the Idaho office have been extremely good citizens. We are proud and happy to have them with us.

As far as our governmental agencies are concerned, they work in close cooperation, bearing in mind the state of development of the art. Some of our people don't know a lot about this sort of thing, but as a good case in point, Senator, I think it is next week some time I am going over to make an award that the Department of Labor gives to the people who amass a large number of accident free hours. I think this is the General Electric Co. who are one of the contractors there. Something like 3 million man-hours without time lost accident. The basis on which that award is made is in part inspections by our Department of Labor.

Senator DWORSHAK. After serving on this committee, and hearing the scientific and technical testimony which we hear from week to week, I am aware of the fact that it might be difficult for the State of Idaho or a State government anywhere where a similar installation is located, to take a direct part in supervising this atomic energy development. I note that it is suggested that a training program be initiated to enable officials of State governments to have a better comprehension of this act and the atomic energy industry, and developments, so that the State representatives will be better qualified to assume these responsibilities.

Governor SMYLIE. I am advised by our staff in the Joint Committee that some 9 or 10 States would have facilities and people avail-

able at the moment to accept a part of this shared responsibility. But I do think the training provisions in the bill are perhaps its most important aspect, because this would give the States the training facilities in which they could get people ready to move in the direction of a more totally shared responsibility, perhaps concurrent jurisdiction or a complete session of Federal responsibility in some of these fields.

Representative PRICE. Governor, unfortunately I came in a little late, because of some other business, but I am not clear as to the nature of disagreement between the State Board of Health and the representatives of the Atomic Energy Commission. Will you be more specific as to the nature of the dispute between your people and the AEC people?

Governor SMYLIE. If I might put it this way, Mr. Price, I think it is probably more apparent than real. Dr. Carver is our chief public health officer and like all people in that field, he wants to be sure. He has not the information at his disposal with respect to the very question he discusses in the concluding paragraph of his letter. This has been the subject of very great study by the Atomic Energy Commission. We do not know what the underground water movement in the Upper Snake River plain is. It is a very substantial reservoir of water that is underlying that desert. Dr. Carver would like to be certain that radioactive wastes are not getting into the underground water supply and permanently affecting it.

Very substantial tests have been made by the Federal Government and by the Commission and to some extent by our people. We find no evidence that this is the case. I think, as I say, Dr. Carver's disputation is more apparent than it is real. I don't think there is any real conflict here. Certainly nothing that can't be worked out in terms of sitting down and talking the matter over. We have had no difficulty with the Commission in Idaho.

Representative PRICE. In other words, you feel that your differences eventually will be worked out by cooperation between the two?

Governor SMYLIE. Yes. I do believe that a bill such as the bill the committee is considering will have a tendency to establish a framework in which some of these problems can be more thoroughly understood and perhaps more easily coped with.

Representative PRICE. Thank you.

Representative DURHAM. I believe Mr. Toll, our staff counsel, has a question.

Mr. TOLL. Governor, do you think this bill might be improved if a provision were added that the AEC before approving a site for a reactor should consult with the Governor or his designated representatives as to the site of the proposed reactor and at least obtain the views of the State people? It might be that the AEC will have to make the determination in the last analysis because of their superior knowledge and background, but do you think it would be a good idea that they at least consult with the local and State people before going ahead?

Governor SMYLIE. I would think that this might be good Commission practice. Speaking now solely for myself, and not for the committee on whose behalf I am testifying, I would say that the inclusion of such language in a statute I would have some doubt about, simply because of the fact that consultation is a two-way street. You

cannot easily make it mandatory and have it work. I think an expression of concern, for instance, by this committee that that sort of consultation should take place would be helpful. It presents no problem to me, because if I want to find out from Mr. Johnson, who happens to be the manager of the Idaho operations plant, I have no difficulty in finding out what I want to find out if he can tell me. If it is a classified item, this is a different problem. We consult quite regularly. If you ask me the question, "Do I think it would be a good thing to put it in a statute?" if I were talking to my own legislature, I would say "No."

Representative DURHAM. Of course, it is a little different out there than it is near cities of great population. We have had some flarebacks about the locating of these installations more or less arbitrarily on decisions here and not at the local level. I think there is more consideration being given to it now than in the early days. I might say that we did run into some difficulty. Of course, you had wide-open space there, and development has taken place rapidly at Arco.

Governor SMYLIE. I think I am aware of the circumstance that gave rise to this concern on the part of the committee. Of course, it involved a metropolitan area. I think consultation would have been a good idea there, although personalities had something to do with the problem.

Representative DURHAM. I think I can agree with you that consultation should take place at the local level before we get into difficulty and go through the legal procedures before the Commission. That involves delay, as we are all aware. If there are no further questions, Governor, we certainly appreciate your coming here and giving us your views. I think you people in the Governors' group have done an excellent job throughout the whole country. I know my State has taken a great deal of interest in it. You have done an excellent job for the country and for the committee in bringing up something here that is concrete. We have gone into this very carefully in trying to write into law a cooperative effort throughout the country over the past 2 or 3 years. I think we have reached the point where action is necessary by the Federal Government so that we can get along with the job. We thank you for coming here.

Governor SMYLIE. I thank you for the opportunity, Mr. Durham. It just now occurred to me that Governor Hodges, of your State, is a member of our committee, and I am happy to bring his greetings.

Representative DURHAM. Thank you.

The next witness this morning is Mr. Lee M. Hydeman, codirector of the atomic energy research project, University of Michigan Law School. Last fall Mr. Hydeman and codirector, Mr. Berman, prepared a detailed study entitled "Federal-State Responsibility for Radiation Protection and the Need for Federal Legislation." The study was submitted to the Joint Committee on Atomic Energy in January 1959, and was reprinted in full in the Joint Committee print entitled "Atomic Energy Field."

This study obviously represents a large amount of work and careful analysis, and in my opinion will assist the Joint Committee in drafting legislation. We are very glad to receive this fine piece of work and we are glad to have you with us this morning.

STATEMENT OF LEE M. HYDEMAN, CODIRECTOR, ATOMIC ENERGY RESEARCH PROJECT, UNIVERSITY OF MICHIGAN LAW SCHOOL

Mr. HYDEMAN. I thank you very much for Mr. Berman and myself.

My statement today deals with State legislative and regulatory activity in the radiation protection field. I will not attempt to deal with what the States are doing by way of inspection or enforcement of regulations. I understand the witnesses who follow me will direct their attention to these other important facets of State radiation protection activities.

I should also point out that I have not attempted to include any information concerning State activity in the workmen's compensation field or in the insurance field.

Perhaps, at the outset, I should say a few words about the efforts to encourage State action in the radiation protection field and also the legal status of State regulation. In analyzing State activity to date, one cannot ignore the fact that a comprehensive radiation control system has existed at the Federal level of Government since the outset of the atomic energy program. It is true that this system does not encompass certain sources of radiation, principally X-ray machines, radium, and non-reactor-produced isotopes. These other radiation sources, however, have not been a matter of public concern until quite recently. Moreover, the major use of these other sources has been by the medical and dental professions. Certainly the degree of exposure of patients for diagnostic or therapeutic purposes involves professional judgment, an area where no one has suggested governmental control.

In view of the existence of the Federal control system and the nature of radiation activities beyond Federal control, the efforts of groups at the national level and multistate organizations to encourage or discourage State activity and the possible legal status of State regulation in my judgment are important elements in evaluating the promptness and adequacy of State action to date.

Prior to the 1954 act, the Atomic Energy Commission essentially took no action to encourage or foster State attention to problems of radiation protection. More importantly, the leading body of experts in the radiation protection field, the National Committee on Radiation Protection, informally took the position of advising against radiation legislation and regulation. In the words of the committee, they "believed that such action was not only unnecessary, but might be definitely harmful."

At the end of 1955, the NCRP did issue a suggested State radiation protection act and suggested State regulations. The Committee by no means recommended that the States take any legislative or regulatory action, but only published these suggestions as an aid to States or municipalities feeling the need for radiation regulation.

The organization representing the States which has been most active in the atomic energy field, namely, the Council of State Governments, did in its 1957 suggested State legislative program proposed a model bill for adoption by State legislatures. The act suggested by the Council does not provide specific direction to the States with respect to regulation but rather proposes means for assuring proper study and coordination of State activities in the atomic energy and radia-

tion protection fields. While the bill does specify that it is the policy of the State to adopt its laws and regulations to assure protection of the public interest and directs each interested State agency to review the need for changes in their laws and regulations to accomplish this policy, the bill contains no direction as to the areas, if any, to be regulated by the State. The one regulatory feature contained in the Council's proposal is the provision that failure to obtain a proper license from the AEC will be a violation of State law. The Joint Federal-State Action Committee in its December 1957 recommendations to the Governors and State legislatures in the atomic energy field went no further than the Council as far as radiation regulation is concerned.

One other State organization did propose legislation fairly recently. The American Public Health Association issued a suggested State radiation act in 1958. This act contains provisions both requiring State radiation protection regulation and providing for coordination of the various interested State agencies.

In addition, two regional organizations suggested that the States become active in evaluating the impact of atomic energy activities and provide means for coordinating the State programs in this field. The New England Committee on Atomic Energy of the New England Governors Conference in July 1953 recommended a model bill which was the forerunner of the 1957 Council of State Governments recommendation. The Southern Regional Education Board submitted certain recommendations along similar lines to the Southern Governors Conference in 1957. As you know, a regional advisory council was established at that conference and this group is now considering a compact dealing principally with promoting regional nuclear development.

The Atomic Energy Commission has not made any effort to press for State regulation in the radiation protection field but has limited itself to support of the legislation suggested by the Council of State Governments. Moreover, there have been no publicly declared efforts by other Federal agencies to obtain action at the State level to control radiation hazards from peacetime nuclear activities.

Thus, we do not find any real effort at the national or regional level other than the Public Health Association's recent recommendations to encourage States to regulate in the radiation field. Of course, a number of individuals have urged such legislation on the theory that unless the States act Federal responsibility in the field will not be withdrawn.

Mr. TOLL. Mr. Hydeman, do you think if some of the States or if more of the States had issued regulations that this might have had a harmful effect? Since the NCRP has had to revise its standards, and since these are the basis for most State regulations, might this have caused more work for the States than if they waited until the NCRP finalized its recommendations? Mr. McAdams in another hearing testified that he had recommended to the States that they wait until the NCRP made their final recommendations.

Mr. HYDEMAN. I think it is a good thing that the States have not acted precipitously in this matter. In fact, the first State to act is the one that is the furthest away from the present regulations of the Commission and the present considerations of levels contained in the NCRP handbook.

Mr. TOLL. Is that California?

Mr. HYDEMAN. Yes, sir.

Mr. TOLL. Thank you.

Mr. HYDEMAN. Regarding the legal status of any State regulations, a considerable cloud of doubt exists as to the enforcibility of State regulations over the materials covered by the 1954 Atomic Energy Act. On the one hand, the 1954 act sets forth a directive to the Federal agency to adopt a comprehensive scheme of regulations. Such direction by Congress often has been deemed by the courts to preempt State regulation. Further, under the act, the objectives of Federal regulations are to assure protection of the public while not unduly burdening industrial progress, and thus more restrictive requirements by the State might be deemed as interference with national nuclear development policy. On the other hand, the area being regulated, namely health and safety, is one in which there has been a noticeable tendency for the courts not to infer Federal preemption very readily. However, as evidenced by the Supreme Court's decision in *Oregon-Washington Co.* v. *Washington*, the courts have found congressional intent to preempt State health control in an area where a Federal agency was directed to regulate.

Mr. TOLL. Could you give a little summary for the record of that case, please?

Mr. HYDEMAN. That was a 1926 Supreme Court case. The Agriculture Act of 1917 directed the Secretary of Agriculture to impose plant quarantine to prevent or control interstate shipment of plants, either containing disease or having some insect infestation. The State of Washington attempted to quarantine certain incoming agricultural products, principally alfalfa hay, which were infested with the alfalfa weevil. The Court held that the Washington quarantine was inapplicable on the basis that the Secretary of Agriculture had been directed to act with respect to such problems, the fact that he had not acted with respect to this particular crop disease did not mean that the States could act, but was by implication due to the fact that he did not think—the Secretary of Agriculture—action was necessary.

Representative PRICE (presiding). This case, however, had some element of interstate commerce involved.

Mr. HYDEMAN. There is no question that the products on which the quarantine was being imposed by the State did traverse in interstate commerce.

In the absence of a clearer statement by Congress, lawyers are bound to disagree on whether preemption has occurred and how extensive such preemption is. For example, it might be maintained that State radiation regulations of reactors is prohibited but not radiation regulation of isotopes from the standpoint of disposal into local sewer systems. But even here, we cannot ignore the implication of such cases as *Guss* v. *Utah Labor Board*, where the Court found preemption because of the comprehensive nature of the congressional action even though the agency had not chosen to act in the particular situation.

Even if preemption exists, there is room for contention that at least a State can inspect against and enforce regulations parallel to those of the act. The Zook case (a 5-to-4 decision) can be cited in support of such a position. The recent case of *Pennsylvania* v. *Nelson*, how-

ever, casts serious doubt on the authority of a State even to enforce standards parallel to those adopted by Federal authority where the Federal regulatory scheme is pervasive, the field regulated is one where there is a very dominant Federal interest, and the possibility of conflict in administration is serious.

My own conclusion—and these tend to be an oversimplification because of the time factor—is that Congress by the 1954 act probably has preempted licensing from a radiation protection standpoint by the States on the application of a State radiation standard which is more restrictive than the Federal standard over the materials and facilities required to be regulated by the AEC. While it is less clear whether the States are prohibited from enforcing standards parallel to those adopted by the AEC, I would think that a State might well be preempted from doing so, at least with respect to reactors.

Now, I would like to turn my attention to what the States have done. State action in the field of atomic energy, and more specifically radiation protection, has taken three identifiable directions: first, the establishment of advisory groups to study and report on the impact of atomic energy; second, the establishment of an individual or group to coordinate the activities of various State agencies; third, the statutory authorization of regulatory authority and the promulgation of radiation protection regulations under such statute or under previously existing statutory grants of power.

These three types of approaches are not mutually exclusive. In fact, the first two can be viewed as steps in a progression toward asserting radiation regulatory control. Some of the States which have progressed the furthest have adopted all three approaches during the course of developing their radiation protection programs.

I have included the number of States which have taken various types of actions. While I believe the numbers may be helpful as general indicators of State action to date and also of possible future action, a word of caution should be expressed lest I be accused of playing number games. First, a number of States have taken more than one action with respect to radiation protection. Second, some State actions do not fall neatly into general categories.

STUDY COMMISSIONS

The initial step taken by 17 States has been to establish special study commissions. These commissions by and large are of temporary nature, existing until their recommendations are tendered to the Governor or State legislature. Some of these temporary groups have evolved into permanent coordinating commissions and in one instance, namely, Tennessee, legislation has been proposed to make an advisory committee to the Governor a permanent group to be placed in an existing State agency. The purpose of these study commissions has been primarily to consider means for promoting nuclear development within the State and to consider State organizational questions and only incidentally to consider the need for radiation control. In addition to these individual State groups, the two multistate advisory groups, which I mentioned earlier—the New England committee and Southern Regional Advisory Council—were formed to study the impact of nuclear energy on State activities.

COORDINATORS

Twenty States, including five which have had study commissions, have established by legislation, and in a few cases through action of the Governor, permanent administrative positions. These positions are assigned the responsibility for promoting nuclear development within the State, for coordinating atomic energy and radiation protection activities of existing State agencies, and for serving as the State's point of contact with other States and the Federal Government on atomic energy matters. The most widely adopted coordinating mechanism is that recommended by the New England committee as later modified by the Council of State Governments. The majority of the coordinators or coordinating commissions have direct responsibility to the Governor but in a few instances the administrative positions are established within a State health, and in one case a State budget, department. While in most instances, State radiation protection regulation must be cleared through the coordinator or coordinating body, no responsibility for initating regulation is placed explicitly in the coordinator with the exception of Kentucky and Ohio.

The need for coordination becomes quite apparent when you consider the number of State agencies having an interest and potential jurisdiction with respect to some aspect of radiation protection. For instance, in the general field of health and safety, at least five State agencies may have some regulatory jurisdiction. These include the public utility commissions, industrial safety commissions, health departments, local health agencies, and city or county councils. Moreover, in a specific area of health control, such as water pollution, as many as six different types of State agencies may be regulating. These include the State health departments, water pollution control bodies, fish and wildlife departments, local water and drainage districts, city sanitation departments, and interstate water control agencies, such as the Ohio River Valley Water Sanitation Commission.

A Massachusetts survey in 1957 indicates 52 departments, divisions, and agencies in the State government have an interest in the control and regulation of radiation materials.

To date, activity on the regulatory side principally has been centralized in State health departments, but in a few instances industrial safety departments have promulgated regulations. And, in New York State, both the labor and health departments have adopted comprehensive radiation protection regulations. In addition, New York City has separate regulations and the Port of New York Authority has adopted transport controls.

REGULATION

Approximately 29 States have either legislated on the matter of controlling radiation activities or adopted regulations. Both the legislative actions and the regulations vary considerably in scope and approach.

Eighteen States have enacted legislation specifically authorizing or directing State agencies to adopt radiation protection regulations. Most of this legislation became effective since the beginning of 1957, and thus in 11 instances the State agencies delegated authority have not acted to adopt regulations of the scope contemplated by the appli-

cable statutes. In no case does the legislation recognize any areas of exclusive Federal authority, but generally the legislation directs the State agency to adopt regulations dealing with all radiation activities within the State.

Twenty-five States have adopted regulations of differing coverage mostly under existing general statutory grants of power. These regulations vary all the way from those dealing solely with fluoroscopic shoe-fitting devices to comprehensive schemes for the registration, inspection, enforcement, and in a few instances licensing of nuclear activities. Eight of the 25 States have adopted so-called comprehensive radiation protection regulations. While these regulations have been categorized for convenience as comprehensive, as opposed to partial, this categorization is somewhat misleading, since at least seven of the so-called partial regulations are applicable to all radiation activities in the State. Comprehensive, as the term is used in characterizing State radiation protection regulation, is not used to identify the scope of activities controlled, but rather to indicate that the regulation includes a fairly complete listing of permissible exposure and disposal levels.

Our analysis at the Michigan Law School of the eight comprehensive regulations discloses no really significant differences between the permissible levels or administrative provisions adopted by the States on the one hand, and those recommended by the NCRP and those contained in the AEC's basic radiation regulations on the other. To the extent that differences exist, they appear to reflect functional differences between the NCRP's recommendations and the AEC's regulations. There has been a noticeable tendency not only to adopt the regulations suggested at the national level, but, perhaps more significantly, to adopt regulations which are increasingly patterned after those of the Federal agency with regulatory responsibility.

Of course, those States which have adopted partial regulations, and in particular those which have established a single level on a daily or weekly basis, tend in a sense to be regulating inconsistently with the nationally recommended standards. They do not differentiate the parts of the body exposed or differentiate between occupational and nonoccupational exposures. In addition to these possible inconsistencies with Federal standards, there are a few instances of the adoption of different permissible levels than those adopted by the AEC.

Three other facets of State control of radiation deserve brief mention. First, as I indicated earlier, most of the legislative authorization for State regulation does not contain any exemption for federally controlled activities. Similarly, State regulation is on its face broadly applicable without exemption to licensees of the AEC. Moreover, only one State provides for exemption of Federal contractors. Seven of the States do exempt transportation activities licensed by Federal authority.

Second, 17 of the States require registration of all radiation activities. Of these, four States treat registration in a licensing sense. In the case of Delaware, North Dakota, and Wyoming, a certificate of registration is to be issued only after a determination that the activity can be safely conducted under the rules and regulations of the State. In the case of Minnesota, the regulation specifically provides for licensing of reactors and other major nuclear facilities. In

this instance, a complete hazard evaluation is required to be submitted prior to construction of the facility, and the facility cannot be operated without a license from the State authority. In all other cases, the regulations provide that registration of the activity does not constitute approval by the State agency.

Mr. TOLL. Mr. Hydeman, in view of your statement on page 6 that you concluded that the Congress by the 1954 act had probably preempted licensing of reactors to the Federal Government rather than to the States, is it your opinion that the Minnesota regulations are valid and binding upon a reactor builder in that State?

Mr. HYDEMAN. I would say that the Minnesota regulations, specifically the provisions dealing with the requirement of a license for the operation of a reactor from the standpoint of its radiation hazard is inapplicable to activities within the State.

Mr. TOLL. But the other provisions?

Mr. HYDEMAN. With respect to registration, it seems to me they are always entitled to registration of activities within the State. If their standards differ slightly, whether they could impose more restrictive standards, I would have serious doubt.

Mr. TOLL. I might point out for the record that a representative from the State of Minnesota is due to testify before this committee this afternoon.

Mr. HYDEMAN. I assume their point of view is somewhat different.

Third, the States have done very little by way of regulation in two areas which are not controlled at the Federal level. The AEC does not exercise any regulatory control over the mining of uranium ore. While the seven States most directly concerned did have a meeting to discuss the hazards of uranium mining in 1955 at Salt Lake City, Utah, only two of these States have adopted a regulation specifying the permissible inhalation dose of radon and its daughter products.

Senator BENNETT. Can you give us for the record the names of those two States?

Mr. HYDEMAN. The two States are Utah and Colorado.

Also, no control exists at the Federal level of intrastate transport of sources of ionizing radiation other than the regulation recently adopted by the AEC covering criticality problems. To my knowledge, very few State transport control regulations have been amended to include radioactive sources.

Mr. TOLL. Has there been any action by any States with respect to uranium mines to require better ventilation facilities?

Mr. HYDEMAN. There have been no specific regulations dealing with ventilation. The two States that I mentioned that have regulations have an inhalation dose specified in their regulation. They do not specify the means of achieving this low level.

Mr. TOLL. Dr. Holladay of the U.S. Public Health Service in Salt Lake City testified before Mr. Price's subcommittee, and he pointed out that one of the things most needed was better ventilation in uranium mines in order to get rid of the gases and the radioactive dust. That is why I wondered whether any States had followed up on this by requiring a mine operator to install some sort of fans or forced ventilation system.

Mr. HYDEMAN. No, not to my knowledge. I think there is a reason for this, and that is that nobody has quite found an economic way, to

my knowledge, for ventilating low-productivity mines. In other words, if you put such a requirement in, you might put some of the mines out of operation.

What can we conclude from the State activity to date? First, without any significant pressure at the national level or by multi-State organizations, and despite a considerable cloud of doubt as to State authority to regulate activities controlled by the AEC, a large number of States have taken some regulatory action. While State action has varied considerably, an increase of broad State regulation of all radiation activities is to be anticipated within the next year or so as a result of State legislative authorization as well as action presently being contemplated by interested State agencies under existing general authority. Second, conflicts to date have been minimal, but the potential for conflict is increasing as States adopt comprehensive radiation protection regulations. While the States have tended to adopt levels consistent with those suggested by national bodies, and parenthetically, I might add that efforts are being made to resolve the difference between the AEC and NCRP standards, there is considerable overlap in activities subject to Federal and State regulation. No effort is being made to limit the State regulation to activities other than those licensed by the Commission and in a few States a license or permit is required in addition to the AEC license. Moreover, in the reactor and high level waste disposal fields, a potential area of serious conflict exists since definitive standards have not been developed for controlling these activities either at the national or State level. More particularly, such conflict is likely to occur under the Minnesota-type of licensing system. In both of these areas, evaluation of the activities involves a judgment under very general criteria such as reasonable risk, and conflict of administration is more likely than where activities are evaluated against fairly precise criteria. Third, while a considerable problem exists in coordinating potential activities of various State agencies in this field, a large number of States have taken action to maximize coordination of the efforts and interests of their agencies. Perhaps it can even be said that on paper at least a more effective approach, at least on paper, to the problem of cordination has been demonstrated at the State level than at the Federal level.

Representative DURHAM (presiding). Thank you very much, Mr. Hydeman. It is an excellent statement, and it shows that you have put in a lot of work in this field, plus what you have already done in your report to the committee last year. I think the same thing concerns you that concerns us on the committee, the fear of overregulation; the danger of duplication by the State agencies and by the Federal Government. Of course, somebody has to promulgate these regulations at some level. Is it your opinion after this extensive study they should be promulgated at the Federal level or should they be more or less, as you say, in the form of taking a risk in some of these things and not be promulgated by any Federal agency, such as Public Health and pollution agencies and State agencies which will be involved? I feel that somebody has to take a lead in writing these regulations, even though it does create a little difficulty at times. The hazard is with us, and we face the problem. Would you mind expressing your opinion as to which group you think should promulgate the regulations?

Mr. HYDEMAN. I think I would have to draw some distinctions, Mr.

Durham, between the basic safety standards and regulations to assure conformance with these standards. It seems to me that the National Committee on Radiation Protection has been doing a considerable job with respect to the establishment of basic levels.

Representative DURHAM. That is true, but they are in disagreement, too. When we get to the States, the States have to promulgate some regulations and who are they going by?

Mr. HYDEMAN. I think by and large the States have tended to follow the recommendations of the National Committee. I think with respect to actually regulating there are a considerable number of activities presently being controlled by the Atomic Energy Commission from a regulatory standpoint that could be turned over to the States, and I think that our report suggests essentially the same kind of split of responsibility as is suggested in the proposal submitted to this committee by the Atomic Energy Commission.

Representative DURHAM. It was brought out here yesterday that 95 percent of the irradiation is coming from X-ray machines and all kinds of tools throughout the country, and only 5 percent of it is emanating from the atomic energy industrial operation at the present time. So the States do have a great responsibility. We have never thought of controlling it at the Federal level, such as telling a man how to use an X-ray machine. We did outlaw the foot machine. I believe that is not used now. I don't know whether that was done voluntarily or by State regulation.

Mr. HYDEMAN. There is no question that a considerable part of the total radiation problem presently is a State responsibility and with respect to X-rays my impression has been that the medical and dental associations themselves have done a good deal to education their professions on the proper use and handling of these devices. I suspect with such machines as X-rays that the problem is much more a problem of education than it is of regulation, and I think this is an area where the States have been particularly good.

Representative DURHAM. As far as I know, no State has made a complete survey. There is one county in Florida which asked some group to make a complete survey of that county. As far as we have been able to learn in the committee, there is no other group in the country that has asked for such a survey of the radiological machines.

Representative PRICE. I don't think that is factual, Mr. Chairman. I think the State of Illinois has done a tremendous job in this area. They have even pinned down registration within the county of every type of machine emitting radioactivity.

Representative DURHAM. I am not aware of it. It has not come out before the committee.

Mr. HYDEMAN. Most of the registration provisions in State laws are of fairly recent origin. I suspect that as of today Mr. Price is probably right that there are a number of States that have most of their X-ray machines registered.

Representative PRICE. Many of the States are doing far more in this area than we know at the present time. There is a considerable amount of work being done. It is a matter of coordination to be sure that all are going toward the same goal, and they don't have a lot of conflicting regulations that make it a little difficult to operate on a national basis.

Mr. HYDEMAN. I think even since our study was completed, which was the early part of this year, and the time I prepared the testimony, which was about a week ago, the number of States that were acting in certain respects have changed quite considerably, particularly with respect to registration.

Representative PRICE. If the chairman will yield further to me, I was going to ask the witness whether he is familiar with the report issued by the Atomic Power Investigating Commission to the General Assembly of the State of Illinois—a very recent report, which appears to me to be a very fine document on a State basis on this subject. I wonder if you are familiar with that.

Mr. HYDEMAN. I think that Dr. Classen, from Illinois, sent me that report quite recently, but I had not had a chance to look at it before I left Ann Arbor. I knew it was in existence.

Representative PRICE. What is the primary objective of the research project of which you are codirector at Michigan University?

Mr. HYDEMAN. As you know, the law school in Michigan has had an interest in the field of atomic energy and the legal problems raised in the field for some time. They held two summer seminars—one I believe, in 1953, and another one approximately in 1956. There was work done by Dean Stason and three members of the faculty in the law school, and the dean decided about a year and a half ago that it would be desirable to set up a full-time project devoted to specific legal and policy problems in the atomic energy field that appeared to be ripe for consideration by university groups. Mr. Berman and myself went out to the university as of approximately September 1 of last year to undertake this project on a full-time basis. Our general approach is to spend approximately half our time on domestic problems and half our time on problems in the international field. Presently, we are undertaking a study of the problems of control of nuclear activities on the seas, which presents, by its very nature, a problem that needs attention at the international level.

Representative PRICE. Mr. Durham introduced legislation in the House which is so recent that you probably have not had a chance to analyze the bill, but in your statement I don't see any reference to what the position you might take is on this type of legislation. Would you mind commenting on that?

Mr. HYDEMAN. The reason no part of my statement today dealt with it is that Mr. Berman and I are coming back to testify on Friday to deal with our opinion with respect to this bill and other possible approaches. Today I was directing myself principally to what the States have done by way of legislation and regulation.

I could comment on it now, but I would prefer to hold off until we present our testimony on Friday, if that is agreeable with you, Mr. Price.

Representative PRICE. Getting back to Mr. Durham's statement a moment ago about the number of radiation sources in a county like Florida, I notice this report to the Illinois General Assembly lists radiation installations registered as of July 15, 1958, in the State of Illinois, total 615. Would you just give us a general idea of the type of radiation installations they may be referring to? Unfortunately, I have not had the time to read this report. What would be the normal radiation installations they would be talking about at the State level?

Mr. HYDEMAN. I would expect most of these are X-ray machines—probably a fair number of radiographic machines—and I would think that very few of the installations are installations licensed under the AEC regulation. I have not read the report. I don't know the breakdown. We had a similar breakdown in Michigan. I think that somewhere in excess of 90 percent of all facilities were medical and dental X-rays, either in the doctors' offices or hospitals.

Representative PRICE. Thank you, Mr. Chairman.

Representative DURHAM. Since you are coming back Friday, Mr. Hydeman, I will defer other questions which do deal directly with the bill. We appreciate your coming down this morning, and we are looking forward to hearing from you again on Friday.

Mr. HYDEMAN. Thank you, sir.

Representative DURHAM. The committee will adjourn until 2 o'clock this afternoon.

(Thereupon, at 11:25 a.m., a recess was taken until 2 p.m., the same day.)

AFTERNOON SESSION

Chairman ANDERSON. I think we better start off, if Dr. Wilson, Dr. Kleinfeld, Mr. Jacoe, and Dr. Visscher, might come forward and take seats. They are all parts of this panel.

ROUNDTABLE REPORT ON ACTIVITIES OF STATES BY DR. W. L. WILSON, TEXAS; DR. MORRIS KLEINFELD, NEW YORK; P. W. JACOE, COLORADO; DR. MAURICE B. VISSCHER, MINNESOTA

Chairman ANDERSON. May I just say in starting that we have Dr. Wilson who will talk on the activities of the State health department; Dr. Kleinfeld on the activities of the State labor department; and Mr. Jacoe on the activities of the State health department, with reference to uranium mining and processing. And Dr. Visscher we have had before and we are very happy to have him here again this afternoon.

I am very hopeful that this will be productive of a good deal of interest by the time we read it.

Dr. Wilson, we are happy that you are here.

Dr. WILSON. Mr. Chairman, as director of the division of occupational health of the State Department of Health of Texas, I have received an invitation to appear here.

We appreciate the privilege of appearing before this distinguished committee to summarize in an informational way some activities of the Texas State Department of Health in the atomic energy field. If we may assist in clarifying and improving a program designed to established the most effective Federal-States relationships, as we visualize the needs, we shall be gratified.

The Joint Committee print on "Selected Materials on Federal-States Cooperation in the Atomic Energy Field, March 1959," contained much factual data pertinent to Texas health activities in the field of atomic energy. Some of that data must be repeated here to simplify this summary of our activities.

AUTHORITY FOR ACTIVITIES

The Texas State Board of Health is legally responsible for protecting and maintaining the public health of all Texas citizens. This responsibility extends to ionizing radiation as it involves health. It is particularly important in conjunction with a section of the workmen's compensation insurance law which includes, among diseases deemed to be occupational diseases, "diseased condition caused by exposure to X-rays or radioactive substances."

The State board of health has a general power to prescribe and promulgate such administrative rules and regulations as may be deemed necessary for the effective performance of the duties imposed upon them to protect and maintain the health of the people of the State.

With this broad authority that board accepted responsibility in March 1956 for promulgating its regulations on radiation exposure (exhibit 1, p. 143) which became effective September 1, 1956. At the same time the administration of these regulations was assigned to the Division of Occupational Health, Texas State Department of Health. The regulations apply to specifically designated sources of ionizing radiation, radioactive materials, radiation-producing equipment, and reactors.

While these regulations have been adequate up to now, if applied properly, for protecting the public health, a person can refuse to comply with the regulations, or can neglect compliance, without any fear of punishment.

The State board of health has no effective means for enforcing compliance with the regulations. Recognizing this, the Texas State Department of Health sponsored legislation, although unsuccessfully, by the just ended 56th legislature—regular session—which would have achieved three things:

(1) Confirmed by statute, more specific authority of the State board of health to promulgate and distribute their regulations.

(2) Required compliance with Texas State Board of Health regulations on radiation exposure.

(3) Penalized or controlled more effectively anyone refusing to register with the State Department of Health specified radioactive materials or radiation producing equipment or refusing to comply with the regulations.

In lieu of the requested legislation, a concurrent resolution, No. 42, established a—

> Committee composed of fifteen (15) members * * * constituted to coordinate and complete a comprehensive study involving all aspects of radiation as it affects the public, industry, health, research groups, and others of our State and the need for protection of all concerned. * * *

STATE BOARD OF HEALTH EXPERIENCE WITH REGULATIONS

The State board of health appreciates its responsibilities in visualizing that ionizing radiation must be properly controlled from a health viewpoint, if it is to be used scientifically, economically, in education or in research.

The board has observed closely for 3 years the effects of ionizing radiation; determined where most sources of ionizing radiation are located in Texas; has informed all persons who are or should be con-

cerned as to the location, quantity, and nature of ionizing radiation sources in Texas.

The board has instituted all measures available to it to protect and maintain the health of those who are or can be exposed to too much ionizing radiation, either at work or elsewhere; whether exposing themselves, their employees, or others innocently nearby.

Excessive exposures have been illegal or purely accidental without illegal activity, some due to lack of knowledge or loss of control of radiation despite the best precautions. It has been recognized on the other hand, that it is necessary to give greater than usual doses to some people deliberately for diagnoses and treatments by licensed practitioners of the healing arts, such specific exposures being recognized as based on the sound, best, and most conscientious scientific knowledge and professional judgment our Nation has been able to develop.

GENERAL DESCRIPTION OF REGULATIONS

The Texas regulations on radiation exposure (exhibit 1) are general but comprehensive; require registration of specified sources of radioactive material and radiation-producing equipment; prescribe specific levels of exposure and maximum permissible dose; adhere closely to, and are kept current with standards and procedures (exhibit 2, p. 171) established by the National Committee on Radiation Protection and Measurements, as published in National Bureau of Standards handbooks (exhibit 3, p. 176), require reporting of excessive radiation dose. To establish here, excessive radiation dose is defined in the regulations. They are entirely compatible with all Federal laws and regulations.

REGISTRATION OF SOURCES

There are 3,637 registrants of 4,045 total sources of radiation in 218 of the 254 counties of Texas (exhibit 4, p. 178). These include 361 isotope licensees, by the Atomic Energy Commission, 301 radium registrants, and 4 reactors. While Texas usually ranks fifth among the States in overall isotope licensees it is third in medical licensees. The increasing trend in registrations of X-ray equipment leveled off in November 1958 (fig. 1) but has veered upward for radioactive materials since September 1958 (fig. 2).

PUBLIC COMPLIANCE WITH REGULATIONS

The nature of industrial, educational, medical, research, and other uses of ionizing radiation sources in Texas is indicated in our numercial summary of registrants (exhibit 4, p. 178). The effectiveness of their efforts to control the sources safely without handicapping their uses have gratified all of us.

There have been few deficiencies in eliciting cooperation throughout the State in the application of ionizing radiation now in the hands of thousands of people of good faith. But some with interests conflicting with the best interests of the public health have created dangerous health problems.

With ever-increasing civilian application of ionizing radiation such dangers will increase in Texas unless additional authority and means are provided to some agency to prevent their incidence.

FIGURE 1

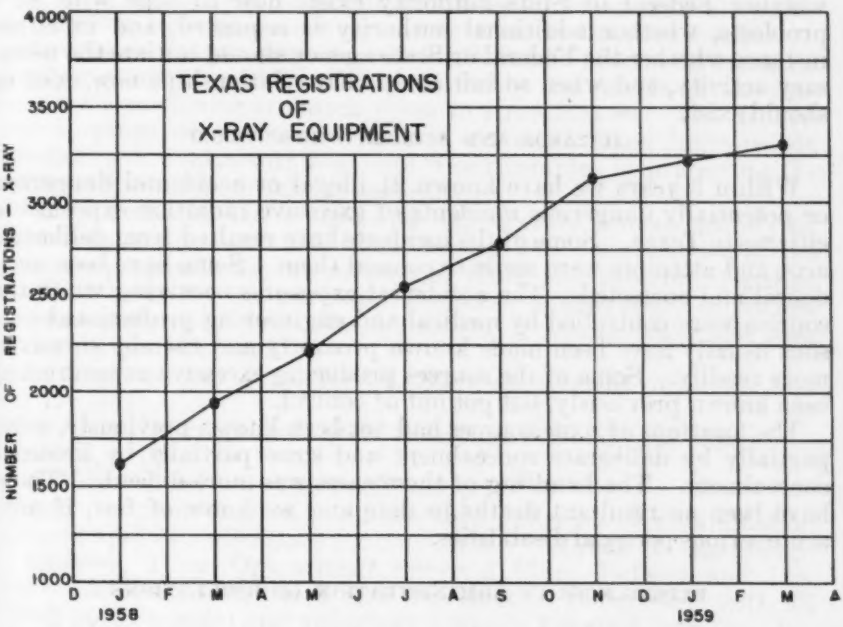
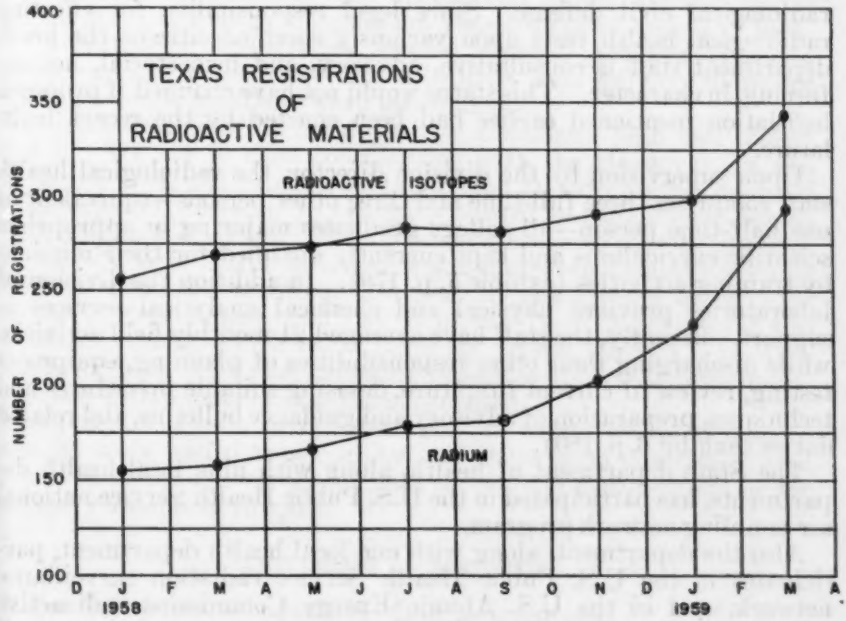


FIGURE 2



There is understandable uncertainty on the part of many as to whether Federal or State authority exists now to cope with such problems, whether additional authority is requested, and in either instance whether the Federal or State agency should initiate the necessary activity, and when so initiated, what relationships now exist or should exist.

HAZARDS AND ACCIDENTS DISCOVERED

Within 3 years we have known 21 illegal or accidental dangerous or potentially dangerous incidents of excessive radiation exposure to citizens in Texas. Some of the incidents have resulted from deliberate acts, and attempts were made to conceal them. Some have been accidental and corrected. The accidental exposures occurring while the sources were controlled by medical and engineering professional persons usually have been made known promptly and thereby corrected more readily. Some of the sources producing excessive exposure had been known previously, but got out of control.

The locations of some sources had not been known previously, some partially by deliberate concealment and some partially by innocent concealment. The handling of these cases was more difficult. There have been no resultant deaths to date and we know of few, if any, acute serious personal disabilities.

EXPERIENCES IN ADMINISTRATION OF REGULATIONS

As stated earlier the State department of health, division of occupational health, administers the State's regulations, and the division plans for and would direct response to critical emergencies, including radiological civil defense. Since legal responsibility for effecting radiological health rests upon variously specified citizens the heath department staff is consultative, advisory, and inspectorial, not enforcing, in character. This status would not have changed if proposed legislation mentioned earlier had been enacted by the recent legislature.

Upon supervision by the division director, the radiological health staff comprises three full-time and three other persons—equivalent of one half-time person—all college graduates majoring in appropriate scientific curriculums and kept currently qualified for their missions by training activities (exhibit 5, p. 179). In addition the division of laboratories provides physical and chemical analytical services in support. Recently, the staff have averaged 21 monthly field activities while discharging their other responsibilities of planning, equipment testing, review of current literature, devising suitable procedures and techniques, preparation of advisory and guidance bulletins, and related duties (exhibit 6, p. 180).

The State department of health, along with nine local health departments, has participated in the U.S. Public Health Service national air sampling network program.

Also the department, along with one local health department, participates in the U.S. Public Health Service radiation surveillance network, and in the U.S. Atomic Energy Commission radioactive fallout sampling programs. The first program assessed the overall air pollution loading including radioactivity and the latter two assess

the radioactivity loading in the atmosphere due to nuclear device tests. The department is vitally interested in the overall air pollution loading including radiation levels from radioactive nuclei.

The department participates in the U.S. Public Health Service milk sampling program and has followed closely the results of the program with particular attention given to strontium 90. The department is prepared to expand its own activities when indicated in collection and analysis of food and water samples in protecting the public from external or fallout hazards.

Normal activities are studied and implemented almost entirely by field visits, conferences and consultation, and correspondence, the latter, frequently involving reviews of plans and procedural guides furnished to us for the purpose. Response to emergency or critical incidents other than civil defense response to enemy attack has been planned by preparation of—

(1) A procedural guide for the State department of health (exhibit 7, p. 181).

(2) An advisory guide to other State agencies and local authorities (exhibit 8, p. 199).

(3) Educational activities (exhibit 9, p. 217).

Ready for reproduction is an advisory guide on decontamination measures against radioactive contaminants. "Annex H—Radiological Defense, Texas Operational Survival Plan—Defense and Disaster"—has been distributed and coordination undertaken with all related governmental and voluntary agencies for civil defense. Approximately 30,000 copies of regulations and advisory bulletins have been distributed in 3 years.

All department planning and operational guides are compatible with the Atomic Energy Commission-Department of Defense "Technical Information Bulletin on Atomic Weapon Accident Hazards, Precautions and Procedures" and with more local military plans for handling peacetime nuclear weapons accidents.

We have available the Strategic Air Command plan and understand it. We are in close coordination with the Headquarters, 4th U.S. Army area, and provide that command all information essential to military-civil response to extensive hazard to radiological health or response to a disaster. That command keeps us equally in mind.

Numerous local health department and nongovernmental personnel have been furnished training. During the past 3 years we have instructed in radiological health at 13 of the Texas Agricultural and Mechanical College Firemen's Training School sessions. In 1958 alone 1,642 from 405 cities, including representatives also from industry, safety groups, and civil defense, benefited.

Equipment has been procured to the full extent we could demonstrate its truly useful applicability, and there is no unsatisfied need for proven equipment either for field survey and measurement or for laboratory analytical support.

LIMITATIONS TO ACTIVITIES

Major limitations to expansion of our program are:

(1) Costs of travel;

(2) Loss of time required in travel, both due to great distances between field survey points;

There is understandable uncertainty on the part of many as to whether Federal or State authority exists now to cope with such problems, whether additional authority is requested, and in either instance whether the Federal or State agency should initiate the necessary activity, and when so initiated, what relationships now exist or should exist.

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LIMITATIONS TO ACTIVITIES

Major limitations to expansion of our program are:

(1) Costs of travel;

(2) Loss of time required in travel, both due to great distances between field survey points;

(3) Insufficient budget for employment of additional State personnel, training of available and/or the additional State personnel, and travel to and from field surveys;

(4) Slow acceptance by local authorities of responsibility for implementing radiological health programs—and we understand their reasons for this, I would like to inject;

(5) Insuring sufficient qualifications for private organizations and local governmental personnel responsible for their respective radiological health programs; and

(6) Effective and economical means for insuring timely availability of suitable, accurate equipment.

PLANS AND READINESS FOR FUTURE ACTIVITIES

With no reduction in current staff or funds, we shall continue to achieve the following:

(1) Maintain the most up-to-date knowledge and reference materials essential to the radiological health program, and disseminate such to those utilizing sources of ionizing radiation.

(2) Distribute to appropriate local authority specific technical and scientific information and timely advice peculiar to planning and implementing particular phases of their programs in direct local application.

(3) Insure integrated radiological health activities and the solution of related problems throughout the State.

(4) Study directly on the site, and assure laboratory analyses where indicated, potential and actual radiological health hazards. During fiscal year 1960 340 registrants of radioactive materials will be inspected and during fiscal year 1961 280 will be inspected.

I would like to introduce there, Mr. Chairman, that up to now we have not done a planned survey or study of X-ray equipment. We have done what we call brush-fire operations as consultants to aid and assist anyone requesting it. We have had certain complaints registered where we would go out and do a positive identification and measurement and interpretation. But we have not done a planned X-ray program.

Projected, however, is a more systematic survey, and I should like to mention there that we work very closely with our professional groups most interested in this. For example, our Texas Medical Association has a permanent committee on this problem. Our Texas Dental Association is very interested, and our other licensed practitioners take a positive interest and we do everything we can to assist them.

(5) We plan providing consultative advice and field visits upon request.

(6) Participate in conferences, seminars, and training sessions.

(7) Plan and assure establishment of an adequate radiological defense program for the State's civil defense.

(8) Maintain, calibrate, and repair where necessary our instruments.

(9) Insure the maintenance of accurate records on all exposures so that positive identification can be made of the nature and extent of any excessive radiation dose which may occur, as defined in our regulations.

RELATIONSHIP WITH FEDERAL AGENCIES

We have worked regularly in close and beneficial harmony with representatives of the U.S. Atomic Energy Commission, especially its Albuquerque staff. We maintain an equally fortunate mutual relationship with the Public Health Service. The confidence we have in military authorities already has been indicated. Many military and civilian Federal agencies have registered with us voluntarily.

We have frequent interchange of publications and reference materials with all of these agencies. There would be no friendlier but there could be more sound basis for our relationships by clear delineation of all of our respective responsibilities and authorities. There should be also a resultant increased assurance of provision of means for radiological health after such responsibilities might be more clearly defined.

SUMMARY

A brief orientation on Texas State Department of Health activities in the field of atomic energy has been presented. It barely listed authority for the activities, summarized content of pertinent State regulations, and mentioned State board of health, State department of health, and the public's experiences during their 3 years' application; distribution of Texas registrants of radiation sources has been indicated. The State's activities to meet accidents and disasters created by radiation, as well as some limitations to more ideal activity, are discussed. Our current capacities and our relationships with Federal agencies have been mentioned.

I am furnishing along with this statement appropriate exhibits which document each and every one of the statements I have made.

In conclusion, it is most encouraging to know that the Congress of the United States is considering legislation, designed by conscientious public servants, which should insure more adequate radiological health programs in Federal, State, and local governmental agencies. Any feasible assistance we can contribute to the desirable ends no doubt will be requested, and may be expected to be forthcoming.

Chairman ANDERSON. Thank you, Dr. Wilson. That is a very fine statement.

You asked some questions at the bottom of page 4. At least you said there was understandable uncertainty on the part of many as to whether Federal or State authority exists to cope with these problems and so forth. There has been a sort of general theory that perhaps the isotope work belongs to the State and the reactor work may belong to the Federal Government.

I notice at the top of the page you said there were 361 isotope licensees. I think supervision of those may very properly rest with your Department.

Then you monitored four reactors. I would assume that the Federal Government might need to take care of some of the technical work in connection with those. I am happy to have you raise the question because that is the real purpose of this hearing. We do want to find out what can be the function of the State, and what the Federal Government's, and, in the gray zones in between, see if we can be helpful. I am glad you raised the question so clearly.

Could you tell us, with reference to the Kellogg incident in Houston, whether your Department found some evidence that the company had been advised to close the hot cell where the accident occurred?

Dr. WILSON. I don't think our Department demonstrated that to be exact. I think that was developed more by another investigator.

Chairman ANDERSON. Could you help me any on it?

Dr. WILSON. I doubt if I should, sir. I don't qualify for fact.

Chairman ANDERSON. I will withdraw the question. We had some interest in that incident.

Dr. WILSON. Yes, sir. I am sorry I cannot properly do it for you.

Chairman ANDERSON. We had some testimony from Dr. Lieberman of the AEC yesterday concerning the proposed issuance of an AEC license to a company in Houston, Tex., for the disposal of certain solid low-level radioactive waste products in the Gulf of Mexico. He stated that such disposal would be less hazardous than routine disposal by the British of low-level liquid weights in the Irish Sea. Has the AEC consulted with you on this proposed license, and if so, are you satisfied with the safety of this waste disposal operation?

Dr. WILSON. First, we have known of the proposed activity, being kept informed by the applicant since 1957. We have kept fully informed from the beginning as to the details of the planned activity. The AEC did keep us informed of their activities and we were able to discuss back and forth. So we knew what the AEC had as their problems. We do not have on our staff fully qualified personnel in the field of oceanography or experience in disposals of this nature. Therefore, any opinion we had would be based entirely on materials from committees or groups, National Academy of Sciences, National Research Council Committee, or the AEC, or consultations with our colleagues in the Public Health Service as to an opinion whether this would be a safe measure.

Based upon all of the published information that we have seen—and not pretending to qualify—we could not find any true justification for assuming that this would be hazardous. On the other hand, we could not demonstrate that it could not be.

Chairman ANDERSON. I think that is a very good answer. Thank you very much.

(The exhibits referred to in Dr. Wilson's statement follow:)

NO. 1
Amendment – 1

OCCUPATIONAL HEALTH REGULATIONS

RADIATION EXPOSURE

(Supplements Regulations on Radiation Exposure, OH–1, September 1, 1956 by Addition to Section 7(a))

Effective September 15, 1957

CONSULT LOCAL HEALTH DEPARTMENTS AND PHYSICIANS

FOR

INFORMATION AND ADVICE

ON METHODS OF CONTROL OVER

HEALTH HAZARDS TO ALL WORKERS

AND

INDUSTRIAL DISEASES AND INJURIES

TEXAS STATE DEPARTMENT OF HEALTH
DIVISION OF OCCUPATIONAL HEALTH
Austin 1, Texas

This supplementary amendment was adopted by the Texas State Board of Health on September 9, 1957, in accordance with the authority granted in Article 4418d of the Revised Civil Statutes, State of Texas, and is promulgated in accordance with Article 4477, Section 19.

Add to the end of Section 7(a), page 4, OH-1, September 1, 1956, Regulations on Radiation Exposure, (approved by the Texas State Board of Health June 18, 1956):

"No individual except one authorized by and licensed in accordance with Texas' Statutes to engage in the healing arts, or one properly trained and serving under responsible direction of such a licensed individual, shall utilize radiation, including fluoroscopy, in any type of examination of a person, nor expose intentionally any part of a person to an excessive radiation dose. (See 4(b) for authorized exemptions.) In applying this regulation shoe-fitting fluoroscopes are hereby declared as being neither for diagnostic nor therapeutic purpose."

REGULATIONS

ON

RADIATION EXPOSURE

Effective Sept. 1, 1956

ADOPTED BY

THE TEXAS STATE BOARD OF HEALTH

TEXAS STATE DEPARTMENT OF HEALTH

AUSTIN, TEXAS

OH-1

PREFACE

a. The main endeavor of these regulations is to incorporate the basic technical principles that should be applied uniformly.
b. These regulations are based on present knowledge of radiation and its biologic effects; with further research this information can be expected to improve. The Texas State Department of Health will publish from time to time such new information as it deems pertinent, giving references to the sources of new data.
c. Although the values proposed for maximum permissible dose are such as to involve a risk that is small compared to the other hazards of life; nevertheless in view of the unsatisfactory nature of much of the evidence on which the judgments must be based, coupled with the probability that certain radiation effects are irreversible and cumulative, it is strongly recommended that every effort be made to reduce the dose of all types of ionizing radiations to the lowest practicable level.
d. Because it is not possible to predict the period of time over which an individual may be occupationally exposed to radiation, it is assumed that he will be so exposed at more or less a uniform average rate over his entire adult lifetime. Occasional exposure rates higher than those specified cannot be justified by assuming lower future exposures because of the arbitrary limitation that would be placed on a person's future freedom of action. (See sections 7 and 15 of these regulations.)
e. The maximum permissible dose for an individual shall be considered to include all doses from all types and energies of radiation, whether delivered simultaneously or successively, during the period of measurement to the region of interest.
f. The requirements specified in these regulations are consistent with the recommendations of the National Committee on Radiation Protection.
g. These regulations were adopted by the Texas State Board of Health on June 18, 1956 in accordance with the authority granted in Article 4418d of the Revised Civil Statutes, State of Texas. Dissemination of this information as an industrial standard is also in accordance with Article 4477, Section 19(b).

1. SCOPE

It is the purpose of these regulations to state such requirements as shall be applied in the use of all radiation, radiation machines, and radioactive materials to insure the maximum safety to all persons at, or in the vicinity of, the place of use, storage, or disposal thereof. These regulations are intended to be consistent with the best of use of radiation machines and radioactive materials.

2. APPLICATION

(a) All radiation machines and radioactive materials shall be manufactured, used, stored, handled, transported, or disposed of in such manner that no person shall receive an excessive radiation dose therefrom. Except as exempted by the provisions of section 4 of these regulations, the manufacture, use, storage, handling, transportation, or disposal of radiation machines and radioactive materials shall be subject to the specific regulations provided below.

(b) For the purposes of these regulations, radiation machines and radioactive materials used by, or in the possession of, an employee within the scope of his duties shall be considered to be in the possession of the employer.

3. DEFINITIONS

For the purposes of these regulations the following definitions shall apply:

Absorbed dose of any radiation is the amount of energy imparted to matter by ionizing particles per unit mass of irradiated material at the place of interest.

Adult is a person of age 18 or more. This age limitation is for radiation-protection purposes only and bears no relationship to age limits for social, political, or other legal considerations.

Agency is that governmental agency that is given the responsibility for administering these regulations. In this case, the Texas State Department of Health.

Body burden is the amount of radioactive material in the body at the time of interest.

Critical organ is that part of the body that is most susceptible to radiation damage under the specific conditions considered.

Excessive radiation dose is a dose of radiation in excess of the maximum permissible dose. (Depending upon the degree of excess, these conditions represent serious hazard only when they are maintained or repeated frequently over long periods of time.)

Harmful effect is any body injury, disease, or impairment, except where such condition is transitory, infrequent, or of short duration, and does not endanger persons so affected.

Installation is the area of radiation hazard under the administrative control of the person or organization possessing the source of radiation.

Maximum permissible dose is a dose of radiation that, in the light of present knowledge, is not expected to cause appreciable bodily injury to a person at any time during his lifetime.

Personnel monitoring is the determination of the radiation dose received by a person during a specified period.

Population group is a civil population (usually more than 100,000 persons) living in geographic proximity and generally dependent upon the same sources of food and water.

Qualified expert is a person fitted by training and experience to perform dependable radiation surveys, to oversee radiation monitoring, and to estimate the degree of radiation hazard. If the ability of a qualified expert is questioned, the Agency shall be the judge of his qualifications, in regard to which it may consider the testimony of other persons whom it deems expert.

Rad is the unit of absorbed dose and is equal to 100 ergs per gram. It is a measure of the energy imparted to matter by ionizing particles per unit mass of irradiated material at the place of interest.

Radiation is gamma rays and x-rays, alpha and beta particles, high-speed electrons, neutrons, protons, and other nuclear particles; but not sound or radio waves, or visible, infrared, or ultraviolet light.

Radiation hazard is any condition that might result in the exposure of persons to radiation in excess of the maximum permissible dose.

Radiation machine is any device that produces radiation when the associated control devices are operated.

Radioactive material is any meterial, solid, liquid, or gas, that emits radiation spontaneously.

Relative Biological Effectiveness (RBE) is the biological effectiveness of one type and energy of radiation, relative to that of lightly filtered x-rays generated at potentials of 200 to 300 kilovolts, for the particular biological system and biological effect, and for the conditions under which the radiation is received.

Rem is the quantity of any radiation such that the energy imparted to a biological system (cell, tissue, organ, or organism) per gram of living matter by the ionizing particles present in the region of interest, has the same biological effectiveness as an absorbed dose of 1 rad from lightly filtered x-rays generated at potentials of 200 to 300 kilovolts. A dose in rems is equal to the dose in rads multiplied by the appropriate RBE.

Sealed source is a quantity of radioactive material so enclosed as to prevent the escape of any radioactive material, but at the same time permitting radiation to come out for use.

Survey is the evaluation of radiation near a source by, or under the supervision of, a qualified expert.

Other scientific and technical terms not herein specifically defined shall be used in accordance with the definitions in (1) recommendations of the National Committee on Radiation Protection as published in Handbooks of the National Bureau of Standards, or (2) National Research Council Glossary of Terms in Nuclear Science and Technology, with preference being in the order given above.

4. EXEMPTIONS

(a) These regulations shall not apply to the following materials, machines, or conditions:

(1) Natural radioactive materials of an equivalent specific radioactivity not exceeding that of natural potassium.
(2) Radioactive material in such quantity that if the entire amount were taken internally, continuously, or at one time by a person, no harmful effect would be likely to result. Listings of the upper limits of quantities of radioactive materials that shall be exempt from these regulations and from registration are given in section 15.c and table 1 of these regulations. These limits apply only for radioactive material not contained in sealed sources.
(3) Radioactive materials in sealed sources in total quantities not exceeding 1 millicurie for a given installation.
(4) Timepieces, instruments, novelties, or devices containing self-luminous elements, except during manufacture or repair of the self-luminous elements themselves.
(5) Electrical equipment that is primarily not intended to produce radiation and that, by nature of design, does not produce radiation at the point of nearest approach at a weekly rate higher than one-tenth (1/10) the appropriate permissible dose for any critical organ exposed. The production testing or production servicing of such equipment shall not be exempt.
(6) Radiation machines not being used in such manner as to produce radiation.
(7) Any radioactive material being transported on vessels, aircraft, railroad cars, or motor vehicles in conformity with the regulations adopted by any agency having jurisdiction over safety during transportation.

(8) The Agency may exempt radiation machines or radioactive materials known to be without hazard, and shall authorize the labeling of the ones that it does exempt.

(b) Nothing in these regulations shall be construed to limit the kind and amount of radiation that may be intentionally applied to a person for diagnostic or therapeutic purposes by, or under the direction of, a physician or dentist. (d)

5. STANDARDS (e)

Recommendations of the National Committee on Radiation Protection as published in Handbooks of the National Bureau of Standards shall be used as guides or standards or as a basis for calculations to obtain or maintain safe working conditions within the meaning of the regulations herein, but shall not be considered in whole or in part as a portion of these regulations unless specifically so stated.

6. REGISTRATION (f)

(a) Any person using or operating any radiation machine, or storing, manufacturing, using, or handling any radioactive material, shall notify the Agency of the fact in writing within 30 days following the commencement thereof. Said notice shall state the location, nature, and scope of such operation, use, or storage, and shall be reviewed and if necessary brought up to date annually thereafter. (g)

(b) The notification in paragraph (a) above shall include an estimate of any further accession of radiation machines or radioactive material expected during the ensuing year. Any accession in excess of the estimate shall be registered promptly.

(c) Acknowledgement of registration shall not imply the approval by the Agency of the manufacture, storage, use, or operation described in the registration, but shall merely indicate that the Agency has a record of the locations and establishments where radiations are used. (a)

7. MAXIMUM PERMISSIBLE DOSE

(a) The exposure of persons to radiation shall always be kept to the lowest practicable level.

(b) When the source of radiation is outside the body, the maximum permissible dose rate shall not exceed those values specified in section 15.d and table 2 of these regulations. (b)

(c) Quantities of radioactive material on the surface of the body, or on clothing worn by the person, shall not exceed those that will result in average dose rates to any portion of the body greater than the applicable permissible value specified in section 15.d and table 2 of these regulations. (The skin will generally be the critical organ for (c)

sufficiently small sources of radiation. For such cases, the area over which the dose is averaged shall be of the order of 1 square centimeter.) Wounds, cuts, or abrasions of the skin involving contamination shall be given immediate medical attention for the removal of such contamination.

(d) The maximum permissible dose for an individual shall be considered to include all doses, from internal and external sources, from all types and energies of radiation, whether delivered simultaneously or successively, to the region of interest, during the period of measurement.

(e) Radiation dose to the tissues of the body from radioactive materials within the body shall be controlled by limiting the average rates at which radioactive materials are taken into the body either by inhalation or by ingestion. Where such intake results from the occurrence of a radioisotope in the air or water, the average concentration of the radioisotope in the air or water used by the individual shall not exceed the maximum permissible concentration specified in table 5 of these regulations.

(f) The determination of the dose received by persons and degree of hazard present in all places to which these regulations apply shall be guided by nationally recognized standards such as (1) the recommendations of the National Committee on Radiation Protection as published in Handbooks of the National Bureau of Standards, and (2) Safety Standards of the American Standards Association.

(g) The radiation dose to any population group shall be limited to one-tenth (1/10) the maximum permissible amounts stated in section 15 of these regulations.

8. PERSONNEL MONITORING: AREA RADIATION SURVEYS

(a) All accessible areas in the vicinity of radiation-producing sources shall be surveyed by, or under the direction of, a qualified expert using suitable instruments and methods for measuring radiation, to determine the maximum levels of radiation to which persons may be exposed. For protection purposes these measurements shall be reduced to weekly doses taking into consideration the amount of time the radiation is being produced, the work week, and the fraction of the week that any person might be exposed to the radiation.

(b) In lieu of an actual survey a written statement made by a qualified expert based on his analysis of the situation shall be acceptable as evidence of the absence of radiation hazard in a given area.

(c) Personnel monitoring shall be required for each individual for whom there is any reasonable possibility of receiving a weekly dose of all radiations exceeding one-quarter (1/4) of the maximum permissible amounts specified in sections 7.b through 7.f of these regulations taking into consideration the use of protective gloves, aprons, or

other radiation-limiting devices; except that, continuation of personnel monitoring shall not be required if the average dose over a period of 8 weeks proves to be less than one-half (1/2) the maximum permissible amounts specified in section 7.b through 7.f of these regulations. If the specified operating conditions are changed, a new monitoring test over an 8-week period shall be made.

(d) Routine monitoring of persons occupationally exposed to radiation from radiation machines shall not be required when all of the following conditions are met:

(1) A qualified expert has specified the operating conditions under which there is no reasonable chance that any person will be exposed to more than one-quarter (1/4) the maximum permissible dose.
(2) The operating conditions in (1) above are made known to all persons who may be occupationally exposed to the radiation.
(3) The installation continues to operate only under the specified conditions.

(e) Regularly scheduled monitoring of the air within the installation for radiation or radioactive content shall be required when there is any reasonable possibility that the average levels of activity therein may exceed one-quarter (1/4) the amount specified in table 5 of these regulations. Measurements averaged over a maximum period of 13 weeks shall be permissible, but in any case there shall be sufficient monitoring to insure that no radiation hazard exists.

9. RADIATION-EXPOSURE RECORDS AND REPORTS

(a) Records of all measurements required under section 8 above shall be kept available for inspection by the Agency or its representative upon demand. Personnel-monitoring records shall include the Social Security numbers of the workers concerned as an aid in keeping track of an individual's total exposure.

(b) Records of the amount, kind, and disposition of radioactive materials purposefully removed from the installation shall be maintained and available for inspection by the Agency or its representative upon demand.

(c) Upon termination of employment of a person, the Agency shall, upon request, be supplied with a summary statement of that person's average radiation dose. (The estimated maximum dose shall be stated if no personnel monitoring has been carried out.) This record shall include statements of any circumstances wherein the dose to the employee, from any source of radiation, exceeded those specified in these regulations.

(d) When it is known or believed that an accidental dose to a person in the installation may have exceeded five times the amount permitted by applicable portions of sections 7.b through 7.f of these regulations, all facts relative to the occurrence shall be reported in detail to the

Agency within 7 days of the discovery thereof, and a copy of the report shall be put in that person's personnel file. The cause of the overexposure shall immediately be sought out and corrected.

10. RESPONSIBILITY

(a) All work performed in an installation where radiation may be present shall be under the direction of a person responsible for the radiation safety therein. His name shall be reported to the Agency.

(b) The person in charge of the radiation safety in an installation shall have the following responsibilities:

(1) He shall inform himself of the hazards attendant upon the presence of radiation in the installation and, if necessary to this end, obtain the services of a qualified expert.

(2) He shall provide, or cause to be provided, any necessary instruction concerning the attendant radiation hazards and safe working practices, to all employees whose duties necessitate the handling of radioactive material or the operation of any machines that produce radiation in amount that leads to hazard, and to all other employees who are not regularly employed at such work but who may occasionally be exposed to radiation.

(3) He shall insure beyond reasonable doubt that all persons working with radiation machines or radioactive materials, and all authorized visitors to areas where radiation may be present, are properly and adequately instructed in the use of all necessary safeguards and procedures, and are supplied with such auxiliary devices as may be necessary for safety.

(4) He shall insure beyond reasonable doubt that no radioactive material (including that in patients, animals, and equipment) is allowed to leave the jurisdiction of the radiation user under circumstances that may subject other persons to radiation in amounts in excess of those indicated in sections 7.b through 7.f of these regulations.

(5) He shall insure beyond reasonable doubt that any area, inside or outside the installation, normally occupied by adults not primarily engaged in radiation or associated work, cannot be subjected to radiation levels exceeding the maximum permissible amounts indicated in sections 7.b through 7.f of these regulations.

(6) He shall insure beyond reasonable doubt that any area, inside or outside the installations, that may be habitually occupied by persons under 45 years of age and not engaged in radiation work, cannot be subjected to radiation levels exceeding one-tenth (1/10) the maximum permissible amounts indicated in sections 7.b through 7.f of these regulations, except that such exposure may be averaged over 1 year. Normal occupational exposures of pregnant women should be considered as acceptable risks.

(7) He shall notify the building superintendent or other appropriate official of the existence of any areas not normally occupied but in which hazardous radiation exposure may take place; e.g., an air-conditioning equipment room beneath x-ray installation.

(8) He shall notify the building superintendent or other appropriate official of the existence of any conditions or situations that, while not normally considered a radiation hazard, may become a hazard under special or unusual circumstances; e.g., entrapment of waste in a drainage line.

(9) He shall, by means of appropriate surveying or monitoring procedures, insure that radioactivity discharged to the atmosphere, at any point where persons may breathe the air, shall be maintained at an average concentration of radioactivity below the maximum permissible levels indicated in section 7 of these regulations.

(c) Every employee and authorized visitor shall be responsible for using such safety devices as are furnished for his protection and for carrying out all radiation-safety rules that concern or affect his conduct.

11. STORAGE OF RADIOACTIVE MATERIALS

(a) Radioactive materials shall be stored or kept in such a manner as to insure that the dose rate therefrom shall not exceed the appropriate limits specified in section 7 of these regulations.

(b) Vaults or rooms in which radioactive materials are stored shall be so located and/or constructed that no person shall be exposed to radiation therefrom in excess of the appropriate limits set forth in sections 7.b through 7.f of these regulations.

(c) Radioactive materials in a workroom or other location where persons are regularly or frequently present shall be enclosed in containers of such thickness, material, and construction, or otherwise shielded in such manner, that no person will be exposed to radiation in amounts greater than those indicated in sections 7.b through 7.f of these regulations.

(d) Vaults or rooms used for storing materials that may emit radioactive gases shall be suitably ventilated in such a manner that the gases do not constitute a radiation hazard.

(e) When there is any possibility that chemical, radiation, or other action might weaken or rupture the container of radioactive material sufficiently to cause leakage therefrom, the container shall be provided with a suitable secondary tray or catchment adequate to retain the entire amount of radioactive material.

(f) Each container of radioactive material in storage shall, in addition to the standard radiation-hazard symbol (see section 13.c of these regulations), be labeled in such manner that the kind and quantity of material, the date of measurement, and the name of the person responsible for the material can be easily and quickly determined.

(g) Storage containers for radioactive material in excess of 1 curie shall be designed to be resistant to fire and earthquake damage, and to

maintain reasonable temperatures. Containers shall be structurally sound over the period of intended use with due regard to corrosion, radiation, and temperature effects that may develop.

(h) Suitable provision shall be made to minimize the hazard to emergency workers in the event of fire and in situations where earthquake, flood, and windstorm potentials exist.

12. RADIOACTIVE-CONTAMINATION CONTROL

(a) All work with radioactive materials shall be carried out under such conditions as to minimize the possibility of any contamination that would result in any person's being subjected to radiation levels exceeding those specified in section 7 of these regulations.

(b) Where the nature of the work is such that a person or his clothing may become contaminated to such degree as to present a hazard, both shall be suitably monitored. Any contamination leading to doses in excess of the values specified in section 7 of these regulations shall be removed from the contaminated person before that person is permitted to leave the work area. Clothing or other material having contamination in excess of the amounts indicated in section 7 of these regulations shall not be taken from the work area or released to public laundries or cleaners.

(c) Under conditions in which the Agency considers it advisable it may devise or approve a suitable pattern of work rules applicable to individual users. These may vary from one user to another.

(d) Every person using radioactive materials not enclosed in a sealed source shall have on hand or immediately available an instrument or instruments suitable for detecting and measuring contamination in accordance with the requirements of this section. These instruments shall be maintained in proper calibration. Under special circumstances, the Agency may require the same or similar instrumentation for users of radioactive materials in sealed sources.

(e) Any accidental release of radioactive material beyond the control or jurisdiction of the installation shall be reported to the Agency immediately.

13. RADIATION INFORMATION LABELING

(a) All radiation machines shall be clearly labeled as follows:

CAUTION - X-RAYS

This equipment produces x-rays when energized.

(Labels as required under the Federal Food, Drug and Cosmetic Act may be substituted for the above label.)

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(b) All radioactive material not in process or in possession of the user shall be clearly labeled as follows:

(1) Containers for sealed sources of external hazard only:

CAUTION - RADIATION

(Where a time limit is specified, it should be posted.)

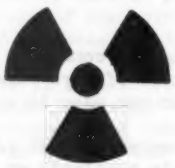
(2) Radioactive material in loose bulk or unsealed containers - internal hazards primarily:

DANGER - RADIOACTIVE MATERIAL

The material contained herein should not be allowed to enter the body either by inhalation, ingestion, or through wounds in the skin.

(Labels as required under the Atomic Energy Act may be substituted, where appropriate, for the above labels.)

(c) The standard symbol for designating any radiation hazard shall be:



The standard color specification shall be a background of yellow with lettering and distinctive symbol in purple (magenta). The use of this symbol for any other purpose is expressly prohibited. The symbol and lettering shall be as large as practical, consistent with size of the equipment or material.

(d) All radioactivity containers, storage areas, work areas, or other normally occupied areas where a radiation hazard may exist shall be posted with accepted radiation-hazard labels, except where such labels may be a source of disturbance to patients undergoing radiation treatment.

(e) Any areas where a radiation hazard may exist on a frequent or infrequent basis, but which are not readily accessible and are so situated as to be occupied only under infrequent and special circumstances, shall be posted with accepted radiation-hazard labels.

(f) All areas that are readily accessible but not normally occupied, and where a radiation hazard may exist on a frequent or infrequent basis, shall be suitably fenced off and posted with the accepted radiation-hazard label.

(g) All radiation-hazard labels posted when a radiation hazard existed shall be removed when the hazard is no longer present.

14. DISPOSAL OF RADIOACTIVE WASTES

(Note: It is impractical or impossible at the present time to formulate detailed waste-disposal regulations that will provide adequate safety under all conditions without being unnecessarily restrictive under most conditions. Not only do the relevant factors vary with each locality, but virtually every radioisotope presents a different problem. A few broad rules applicable to cases of most common interest can be stated, but in general the procedures must be adjusted, in the light of the general guides specified in section 7 of these regulations, to take into account the particular circumstances involved.

(The disposal of radioactive waste, by the nature of the problem, develops situations different from those encountered in the normal handling of radioactive material under controlled conditions. Once a disposal event has taken place all further control over the material usually is completely out of the hands of the disposer; an irreversible train of events will have begun. It is therefore essential that special care and consideration be exercised before any disposal operation is commenced.)

(a) Users of radioactive materials shall release these materials only in such manner that the radioactive material discharged, in combination with that discharged by other users, will not cause contamination of the environment that may result in a person or persons receiving an excessive radiation dose. If several users are discharging radioactive wastes to the same environment, they shall, upon being notified of the fact, cooperate in limiting the release and shall file with the Agency a statement of their agreed pro-rata releases. If this is not done within a reasonable time the Agency arbitrarily may assign quotas to them severally.

(b) Users who release radioactive material may take reasonable advantage of the environmental factors (dilution, dispersion, etc.) to minimize the cost of disposal, provided they meet the performance requirements indicated in paragraph (a) above. Nothing in these regulations shall be construed as permitting release of materials that would be unlawful for other reasons.

(c) Prior to and during design and construction of facilities for the handling and disposal of radioactive wastes, users of radioactive materials may obtain opinions from the Agency regarding the probability of meeting these regulations. However, the user shall remain responsible for meeting the performance standards related to radioactivity established by the Agency and shall allow representatives of the Agency to inspect and evaluate his methods of treatment and release.

(d) For purposes of protection of <u>population groups</u>, the limits of radioactivity resulting from disposal of radioactive material shall be determined on the following basis:

(1) The average concentration of that isotope in air at points where it is commonly used by humans or in water at points of supply (exclusive of treatment, if any) prior to use by humans shall not exceed ten percent (10%) of the maximum permissible levels recommended in table 5, section 15 of these regulations. Concentrations lasting only over a period of a few days may be allowed to exceed the values given in table 5, provided the average concentration over any interval of one year does not exceed ten percent (10%) of these values.

(2) Average rates of radiation dose to persons from radioisotopes outside their bodies shall not exceed ten percent (10%) of the values specified in Rules I through IV, section 15.d of these regulations.

(3) Average concentrations in portions of public waterways not used as sources for human consumption shall be consistent with health, economic, and recreational uses of the water and the future plans for its use that are under consideration by responsible authorities.

(4) For any radioisotope where the effective half-life in the body is less than 60 days, the term "average" as used above shall mean the arithmetic mean of a series of determinations representative of plant operations and environmental conditions over any period of 13 consecutive weeks; for other radioisotopes this arithmetic mean shall be taken over a period of any 12 consecutive months.

(5) If the permissible average concentration of a mixture of radioisotopes in air or water depends almost entirely on the concentration of one of the radioisotopes involved, for routine practical estimates the contributions of the other radioisotopes in the mixture may be neglected. Where more than one isotope is important, the permissible concentration shall be arrived at by adding the exposures to be received from each significant component.

(e) Radioactive wastes may be disposed of by dumping or burial only in areas approved by the Agency for that purpose. Areas approved for this purpose shall be designed and operated so that they comply with the other provisions of these regulations.

15. TECHNICAL STANDARDS, GUIDES, AND GENERAL INFORMATION TO BE USED IN ACHIEVING THE REQUIREMENTS OF THESE REGULATIONS

(a) It will be considered that the data in this section are the best currently available to serve as guides for the fulfillment of the spirit and intent of the regulations.

(b) Modifications in this section will be made whenever the Agency finds it necessary in order to conform to the best practice and new information made known through continuing research.

(c) Maximum amounts of radioactive material permitted without registration. Registration shall not be required for the possession or use of radioactive materials when the total quantities of one or more kinds of radioactive material in any one of the following groups, at any one time, is not exceeded:

Group 1, 1 microcurie
Group 2, 10 microcuries
Group 3, 100 microcuries
Group 4, 1,000 microcuries

Table 1 indicates the place of individual radioactive materials in this group. Any radioactive material not listed in table 1 shall be considered as being in Group 2.

TABLE 1. Ranges of limiting quantities detailed in table 5

Group 1: 1 microcurie
Pb 210, Ra 226, Ac 227, Pu 239, Am 241, Cm 242, Po 219, At 211, U 233

Group 2: 10 microcuries
Sc 46, Co 60, Sr 90, Ru 106, Ag 105, Te 129, I 131, Cs 137, Ce 144, Eu 154, W 181, Re 183, Ir 192

Group 3: 100 microcuries
P 32, Cl 36, Ca 45, Sc 47, Sc 48, V 48, Fe 59, Zn 65, Ga 72, As 76, Rb 86, Sr 89, Y 91, Nb 95, Tc 96, Rh 105, Ag 111, Cd 109, Sn 113, Te 127, Ba 140, La 140, Pr 143, Sm 151, Ho 166, Tm 170, Lu 177, Ta 182, Pt 191, Au 198, Au 199, Tl 200, Tl 204, Pb 203, Th 234, Pt 193

Group 4: 1,000 microcuries
H 3, Be 7, C 14, Na 24, S 35, K 42, Cr 51, Mn 56, Fe 55, Ni 59, Cu 64, Ge 71, Mo 99, Pd 103, Pm 147, Ir 190, Au 196, Tl 201, Tl 202, natural uranium, natural thorium

(d) Permissible dose from external sources of radiation. The following rules govern the occupational exposure of individuals to radiation from sources outside the body:

RULE I. IONIZING RADIATION OF ANY TYPE OR TYPES

For adults under 45 years of age whose entire body, or major portion thereof, is exposed to ionizing radiation from external sources for an indefinite period of years; the maximum permissible total weekly doses shall be 300 mrems in the bloodforming organs, the gonads, and the lenses of the eyes; 600 mrems in the skin; and the respective values of the weekly doses in millirems in all other organs and tissues of the body according to the basic permissible dose distribution. For persons 45 years of age or older similarly exposed, the corresponding maximum permissible total weekly doses shall be double the above-stated values, provided that the portion of the weekly dose in the lenses of the eyes contributed by radiation of high specific ionization does not exceed 300 mrems.

RULE II. X-RAYS (ROENTGEN RAYS, GAMMA RAYS) WITH PHOTON ENERGY LESS THAN 3 MEV

For adults under 45 years of age whose entire body, or major portion thereof, is exposed solely to x-rays with photon energies less than 3 Mev from external sources for an indefinite period of years; the maximum permissible total weekly dose shall be 300 mr measured in air at the point of highest weekly dose in the region occupied by the person, provided that the actual total weekly dose in the gonads does not exceed 300 mrads. For persons 45 years of age or older similarly exposed, the corresponding maximum permissible total weekly doses shall be double the above-stated values, provided that the actual total weekly dose in the lenses of the eyes does not exceed 600 mrads.

RULE III. RADIATION OF VERY LOW PENETRATING POWER (HALF-VALUE LAYER LESS THAN 1 MM OF SOFT TISSUE)

For adults of any age whose entire body, or major portion thereof, is exposed to ionizing radiation of very low penetrating power from external sources for an indefinite period of years; the maximum permissible total weekly dose in the skin shall be 1,500 mrems, provided that the total weekly dose in the lenses of the eyes does not exceed 300 mrems.

RULE IV-A. LOCAL EXPOSURE OF THE HANDS AND FOREARMS TO ANY IONIZING RADIATION

For adults of any age whose hands and forearms are exposed to ionizing radiation from external sources for an indefinite period of years; the maximum permissible total weekly dose shall be 1,500 mrems in the skin, provided the respective weekly doses in millirems in all other tissues of the hands and forearms are not in excess of those that would result from exposure to ordinary x-rays at a weekly dose of 1,500 mr in the skin.

RULE IV-AX. LOCAL EXPOSURE OF THE HANDS AND FOREARMS TO X-RAYS (ROENTGEN RAYS, GAMMA RAYS) OF ANY PHOTON ENERGY

For adults of any age whose hands and forearms are exposed solely to x-rays from external sources for an indefinite period of years, the maximum permissible total weekly dose shall be 1,500 mr in the skin.

RULE IV-B. LOCAL EXPOSURE OF THE FEET AND ANKLES TO ANY IONIZING RADIATION

For adults of any age whose feet and ankles are exposed to ionizing radiation from external sources for an indefinite period of years; the maximum permissible total weekly dose shall be 1,500 mrems in the skin, provided the respective weekly dose in millirems in all other tissues of the feet and ankles are not in excess of those that would result from exposure to ordinary x-rays at a weekly dose of 1,500 mr in the skin.

RULE IV-BX. LOCAL EXPOSURE OF THE FEET AND ANKLES TO X-RAYS (ROENTGEN RAYS, GAMMA RAYS) OF ANY PHOTON ENERGY

For adults of any age whose feet and ankles are exposed solely to x-rays from external sources for an indefinite period of years, the maximum permissible total weekly dose shall be 1,500 mr in the skin.

RULE IV-C. LOCAL EXPOSURE OF THE HEAD AND NECK TO ANY IONIZING RADIATION

For adults whose heads and necks are exposed to ionizing radiation from external sources for an indefinite period of years; the maximum permissible total weekly doses shall be 1,500 mrems in the skin and 300 mrems in the lenses of the eyes provided the respective weekly doses in millirems in all other tissues of the head and neck are not in excess of those that would result from exposure to ordinary x-rays at a weekly dose of 1,500 mr in the skin. For persons 45 years of age or older the weekly dose in the lenses of the eyes may be 600 mrems, provided that the portion contributed by radiation of high specific ionization does not exceed 300 mrems.

RULE IV-CX. LOCAL EXPOSURE OF THE HEAD AND NECK TO X-RAYS (ROENTGEN RAYS, GAMMA RAYS) OF ANY PHOTON ENERGY

For adults whose heads and necks are exposed solely to x-rays from external sources for an indefinite period of years; the maximum permissible total weekly doses shall be 1,500 mr in the skin and (a) 450 mr in the lenses of the eyes of persons under 45 years of age, (b) 600 mr in the lenses of the eyes of persons 45 years of age or older.

RULE V-A. ACCIDENTAL OR EMERGENCY EXPOSURE TO X-RAYS (ROENTGEN RAYS, GAMMA RAYS) WITH PHOTON ENERGY LESS THAN 3 MEV

Accidental or emergency exposure of the whole body of adults or parts thereof to x-rays with photon energy less than 3 Mev, from external sources, occurring only once in the lifetime of the person, under the conditions and in the respective doses stated below, shall be assumed to have no effect on the radiation tolerance status of that person.

(a) Exposure of the whole body - any adult. Total dose, measured in air: up to 25 r.

(b) Local exposure - any adult. Dose measured in air and additional to wholebody dose: (1) Hands and forearms, up to 100 r, (2) feet and ankles, up to 100 r.

RULE V-B. PLANNED EMERGENCY EXPOSURE

Emergency work involving high-level exposure to x-rays with photon energies less than 3 Mev shall be carried out on the basis that the person will not receive doses higher than one-half the respective doses stipulated in Rule V-A. If the doses actually received in the performance of such work do not exceed the respective maximum doses stipulated in Rule V-A, the exposure may be considered to be in the category covered by Rule V-A. Women of reproductive age shall not be subjected to planned emergency exposure.

RULE V-C. ACCIDENTAL OR EMERGENCY EXPOSURE TO OTHER TYPES OF IONIZING RADIATION

Rules V-A and V-B are applicable to accidental or emergency exposure to ionizing radiation of any type and energy when the tissue doses resulting therefrom in the different organs and tissues of the body (expressed in rems) do not exceed numerically the respective tissue doses in rads resulting from exposure to x-rays with photon energy less than 3 Mev, under the conditions stipulated in Rule V-A; provided, however, that the portions of the respective tissue doses in rems contributed by radiation of high specific ionization do not exceed 50 percent of the total tissue doses.

RULE VI. EXPOSURE TO X-RAYS FOR MEDICAL REASONS

Exposure of any part of the body to x-rays resulting from ordinary medical diagnostic procedures shall be assumed to have no effect on the radiation tolerance status of the person concerned, provided that no contributory accidental or emergency exposure of the order of magnitude specified in Rules V has occurred within the previous 3 months.

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In exceptional cases in which it is necessary for a person to receive in 1 week more than the basic permissible weekly organ doses, the unit of time may be extended to 13 weeks (1/4 year); provided that the dose in any organ accumulated during a period of any 7 consecutive days does not exceed the respective basic permissible weekly dose by more than a factor of three; and provided further that the total dose in any organ accumulated during a period of any 13 consecutive weeks does not exceed 10 times the respective basic permissible weekly dose.

For an air dose of 300 mr/week, the critical tissue dose, including backscattering, will depend upon the energy of the x- or gamma rays and on the conditions of exposure. In general, it may be expected that the dose to the critical organ would not exceed the estimated values marked in table 2 with the superscript "b", thus $^{b}( )$. As the permissible dose to the gonads is specifically stated in Rule II, no superscript is applied to the gonad dose for persons under 45.

TABLE 2. Maximum permissible total weekly doses in critical organs under various conditions of external exposure

Conditions of exposure				Critical organ				
				Skin	Blood forming organs	Gonads	Lens of the eye	Air dose*
Part of body	Radiation	Unit	Adult age	Weekly doses in significant volume in region of highest dose area				
								mr
Whole body	Any radiation	mrem	Under 45	600	300	300	300	---
			Over 45	1,200	600	600	[a]600	---
Whole body	X-rays and gamma rays (up to 3 Mev)	mrad	Under 45	[b](450)	[b](400)	300	[b](450)	300
			Over 45	[b](900)	[b](800)	[b](800)	600	600
Whole body	Any radiation with HVL<1 mm of soft tissue	mrem	Under 45	1,500	[c]⌊300⌋	[c]⌊300⌋	300	---
			Over 45	1,500	[c]⌊600⌋	[c]⌊600⌋	[c]⌊600⌋	---
Hands and forearms	Any radiation	mrem	Under 45	1,500	[d]300	300	300	---
			Over 45	1,500	[d]600	600	[a]600	---
Feet and ankles	Any radiation	mrem	Under 45	1,500	[d]300	300	300	---
			Over 45	1,500	[d]600	600	[a]600	---
Head and Neck	Any radiation	mrem	Under 45	1,500	[d]300	300	300	---
			Over 45	1,500	[d]600	600	[a]600	---

* Air dose means that the dose is measured by an appropriate instrument in air in the region of highest dose rate to be occupied by a person, without the presence of the human body or other absorbing and scattering material.

[a] Including not more than 300 mrems of radiation of high specific ionization.

[b] Rough estimates of maximum values resulting from specified air doses, under practical conditions of exposure.

[c] Limits for concurrent exposure to penetrating radiation.

[d] In main portion of body. Not in region of highest dose rate (hand, foot, or head).

In the case of exposure to radiation of very low penetrating power (HVL <1 mm of soft tissue) the values specifically stated in the Rules are 1,500 mrems for the skin and 300 mrems for the lens of the eye, and apply to adults of any age. Because with this radiation the bloodforming organs and gonads would receive a negligible dose, none is stipulated. In practice, however, the same individual may be exposed also to penetrating radiation. In this case the limits for these critical organs should be the same as usual. Because they are different for the two age groups, they are given separately. The lens dose for age 45 and over has been arrived at by analogous reasoning. These additional values are marked $^{c}[\ ]$ in table 2.

In the case of local exposure of the extremities or head and neck, no age distinction is made in the Rules. Again, because whole-body exposure may also occur, the appropriate figures for all critical organs are included. Bloodforming tissue (principally bone marrow) in the designated part of the body (hands, etc.) is in the "region of highest dose rate" and the doses in table 2 should be for a significant volume in this region. However, the high dose in this portion of the bloodforming organs is purposely disregarded in this case. The values marked with the superscript "d" apply to the main portion of the body.

(e) Maximum permissible neutron flux densities. Neutrons are most commonly measured in terms of their flux densities. Table 3 gives the maximum permissible flux densities for neutrons of various energies.

(f) Relative biological effectiveness. The relative biological effectiveness (RBE) applicable to exposure to radiation from external sources is given in table 4.

TABLE 3. Maximum permissible neutron flux densities

Neutron energy	Neutron flux n/cm^2/sec.
0.025 ev	2,000
10 ev	2,000
10 kev	1,000
0.1 Mev	200
0.5 Mev	80
1 Mev	60
2 Mev	40
3 t0 10 Mev	30

In these calculated values, it is assumed that the RBE for gamma rays is 1, and the RBE for protons is 10, in accordance with table 4. Based on 40 hr/week exposure.

TABLE 4. RBE values

Radiation	RBE	Biological effect
X-rays, gamma rays, electrons, and beta rays of all energies.	1.0	Whole-body irradiation (bloodforming organs critical).
Fast neutrons and protons up to 10 Mev.	10	Whole-body irradiation (cataract-formation critical).
Naturally occurring alpha particles.	Compare with 0.1 microcurie Ra, otherwise = 10.	Carcinogensis.
Heavy recoil nuclei.	20	Cataract formation.

(g) Exposure to sources of radiation within the body. Table 5 gives the maximum permissible amounts of radioisotopes in the human body and maximum permissible concentrations in air and water.

(h) In the case of occupational exposure of 8 hr a day (assuming half the daily consumption of air and water in the 8-hr work period), 5 days a week, and 49 weeks a year, the values of maximum permissible concentrations of radioisotopes in air and water in the working area may be increased by a factor of 3 above those values listed in table 5, provided no nonoccupational exposure to radiation occurs.

(i) Recommendations of the National Committee on Radiation Protection. Recommendations on protection against the injurious effect of radiation, published as Handbooks by the National Bureau of Standards, are listed below:

H42 Safe Handling of Radioactive Isotopes
H48 Control and Removal of Radioactive Contamination in Laboratories
H49 Recommendations for Waste Disposal of Phosphorus-32 and Iodine-131 for Medical Users
H51 Radiological Monitoring Methods and Instruments
H52 Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water
H53 Recommendations for the Disposal of Carbon-14 Wastes
H54 Protection Against Radiations from Radium, Cobalt-60 and Cesium-137
H55 Protection Against Betatron-Synchrotron Radiations up to 100 Million Electron Volts
H56 Safe Handling of Cadavers Containing Radioactive Isotopes
H58 Radioactive-Waste Disposal in the Ocean
H59 Permissible Dose from External Sources of Ionizing Radiation
H60 X-ray Protection (Revision of H41)
Burial of Radioactive Wastes in Soil (in preparation)

TABLE 5. Maximum permissible amounts of radioisotopes in total body and maximum permissible concentrations in air and water

Group	Radioisotope	Column I[a] Microcuries per milliliter of air	Column II[a] Microcuries per milliliter of water	Column III Microcuries in total body
--	A 41	5×10^{-7}	5×10^{-4}	30
2	Ag 105	1×10^{-5}	2	18
3	Ag 111	3×10^{-5}	4	36
1	Am 241	3×10^{-11}	1×10^{-4}	0.06
3	As 76	2×10^{-6}	0.2	10
1	At 211	3×10^{-10}	2×10^{-6}	6×10^{-4}
3	Au 198	1×10^{-7}	3×10^{-3}	10
3	Au 199	2.5×10^{-7}	7×10^{-3}	28
3	Ba 140 + La 140	6×10^{-8}	2×10^{-3}	5
4	Be 7	4×10^{-6}	1	670
4	C 14	5×10^{-7}	3×10^{-3}	250
3	Ca 45	3×10^{-8}	5×10^{-4}	65
3	Cd 109 + Ag 109m	7×10^{-8}	7×10^{-2}	40
2	Ce 144 + Pr 144	7×10^{-9}	4×10^{-2}	5
3	Cl 36	4×10^{-7}	2×10^{-3}	200
1	Cm 242	2×10^{-10}	9×10^{-4}	0.05
2	Co 60	1×10^{-6}	2×10^{-2}	3
4	Cr 51	8×10^{-6}	0.5	390
2	Cs 137 + Ba 137m	2×10^{-7}	1.5×10^{-3}	90
4	Cu 64	6×10^{-6}	8×10^{-2}	150
2	Eu 154	6×10^{-9}	3×10^{-2}	22
--	F 18	1×10^{-4}	0.9	24
4	Fe 55	6×10^{-7}	4×10^{-3}	1,000
3	Fe 59	1.5×10^{-8}	1×10^{-4}	11
3	Ga 72	3×10^{-6}	9	8
4	Ge 71	4×10^{-5}	9	67
4	H 3 (HTO or T_2O)	2×10^{-5}	0.2	10^4
3	Ho 166	3×10^{-6}	23	17
2	I 131	5×10^{-9}	3×10^{-5}	0.7
4	Ir 190	7×10^{-7}	1×10^{-2}	21
2	Ir 192	5×10^{-8}	9×10^{-4}	3.4
4	K 42	2×10^{-6}	1×10^{-2}	20
3	La 140	1×10^{-6}	1	24
3	Lu 177	5×10^{-6}	24	78
4	Mn 56	3×10^{-6}	0.15	2
4	Mo 99	2×10^{-3}	14	50
4	Na 24	2×10^{-6}	8×10^{-3}	15
3	Nb 95	4×10^{-7}	4×10^{-3}	90
4	Ni 59	2×10^{-5}	0.25	39
3	P 32	1×10^{-7}	2×10^{-4}	10

Group	Radioisotope	Column I[a] Microcuries per milliliter of air	Column II[a] Microcuries per milliliter of water	Column III Microcuries in total body
3	Pb 203	6.5×10^{-6}	0.1	57
4	Pd 103 + Rh 103	7×10^{-7}	1×10^{-2}	6
4	Pm 147	2×10^{-7}	1	120
1	Po 210 (sol.)	2×10^{-10}	3×10^{-5}	0.02
1	Po 210 (insol.)	7×10^{-11}	--	7×10^{-3}
3	Pr 143	7.5×10^{-7}	0.4	29
1	Pu 239 (sol.)	2×10^{-12}	1.5×10^{-6}	0.04
1	Pu 239 (insol.)	2×10^{-12}	--	0.008
1	Ra 226 + 1/2 dr[b]	8×10^{-12}	4×10^{-8}	0.1
3	Rb 86	4×10^{-7}	3×10^{-3}	60
2	Re 183	8×10^{-6}	8×10^{-2}	35
3	Rh 105	1×10^{-6}	1.5×10^{-2}	9
--	Rn 222 + dr[b]	[c]1×10^{-7}	2×10^{-6}	--
2	Ru 106 + Rh 106	3×10^{-8}	0.1	4
4	S 35	1×10^{-6}	5×10^{-3}	300
2	Sc 46	7×10^{-8}	0.4	6
3	Sm 151	1×10^{-8}	0.2	420
3	Sn 113	6×10^{-7}	0.2	80
3	Sr 89	2×10^{-8}	7×10^{-5}	2
2	Sr 90 + Y 90	2×10^{-10}	8×10^{-7}	1
3	Tc 96	3×10^{-6}	3×10^{-2}	5
3	Te 127	1×10^{-7}	3×10^{-2}	4
2	Te 129	4×10^{-8}	1×10^{-2}	1.3
3	Th 234	6×10^{-7}	3	120
4	Th-natural(insol.)	3×10^{-11}	--	0.002
4	Th - natural	3×10^{-11}	4×10^{-7}	0.01
3	Tm 170	5×10^{-8}	0.25	19
1	U 233 (sol.)	1×10^{-10}	1.5×10^{-4}	0.04
1	U 233 (insol.)	1.6×10^{-11}	--	0.008
4	U - natural (sol.)	1.7×10^{-11}	7×10^{-5}	0.02
4	U - natural(insol.)	1.7×10^{-11}	--	0.009
3	V 48	1×10^{-6}	0.5	20
--	Xe 133	4×10^{-6}	4×10^{-3}	300
3	Xe 135	2×10^{-6}	1×10^{-3}	100
3	Y 91	4×10^{-8}	0.2	15

Group	Radioisotope	Column I[a] Microcuries per milliliter of air	Column II[a] Microcuries per milliliter of water	Column III Microcuries in total body
3	Zn 65	2×10^{-6}	6×10^{-2}	430
	All other beta or gamma emitters	1×10^{-9}	1×10^{-7}	---
	All other alpha emitters	5×10^{-12}	1×10^{-7}	---

[a] The values given in Columns I and II apply to continuous exposures for 24 hr a day. Where exposure is incurred only during a work day of 8 hr, the values in Columns I and II may be multiplied by a factor of 3.

[b] dr stands for daughter products.

[c] The limit given in NBS Handbook 52 is 10^{-8} mc/m. The new value 10^{-7} mc/ml was adopted by the International Commission on Radiological Protection, 1953, and is now acceptable in the United States.

INSTRUCTIONS FOR REGISTRATION OF SOURCES OF NUCLEAR OR X-RADIATION

The owner of every installation shall register the same or cause it to be registered with the Texas State Department of Health within 30 days of receipt of this form.

Changes in installations - The owner of every registered installation or mobile source shall advise the State Department of Health of all changes which may substantially increase potential hazard to any employee.

The following definitions are offered for accomplishing this registration:

1. The owner of an installation shall mean the person or organization having by law the administrative control of a source of radiation located within the confines of installation, whether as owner, lessee, or otherwise.

2. Agent - The person responsible for immediate supervision of the use or application of radiation sources.

3. Installation - A location where for a period of more than 30 days one or more sources of radiation are used, operated or stored. The confines of an installation shall be as designated by the owner. A part of a building, an entire building or plant may be designated as an installation. Where mobile radiographic laboratories or similar considerations are involved, a typical unit and use area should be described, with location of central field headquarters and enumeration of units.

4. Radiation equipment - (If possible, please provide manufacturer, model, serial number, etc) Specifically, the following information should be included, together with the number of fixed installations or mobile sources.

   Industrial X-rays: give the KVP and maximum tube current if available, and purpose of use (radiography of castings, fluoroescence analysis, diffraction for crystallography, fluoroscopy of materials, etc.)
   Medical or Dental X-rays: give KVP and maximum tube current if available and purpose of use (diagnostic, therapeutic, etc.)
   Other: specify any other device, as below, or of type and nature of use not covered in described categories (e.g., fluoroscope, electron microscope, etc.)
   Radioactive Static Eliminators: give type and length of active face, e.g., Alphatron, 24" long: Ionotron T-200, 24" long; also briefly give types of machines on which installed or other use.
   Beta ray gauges: give amount and type of radioactive element if available, e.g., 10 millicuries of Strontium 90, and type of machine on which installed. or other use.
   Nuclear reactors: give power in kilowatts, amount of source material therein, and briefly describe type (e.g., U-235 package power reactor, air-cooled U-238 homogeneous fast breeder, pressurized water reactor, etc.)
   Particle accelerators: give type, voltage and purpose or use (e.g., betatron, 30 million volts, X-ray generation; Van de Graaff electrostatic accelerator, 10 million volts, acceleration of protons.)

5. Radioactive materials - Identify, give strength, and nature of use and specify whether source is sealed or unsealed. Estimate quantity of material used annually and for short-lived isotopes, maximum amount on hand at any one time; e.g., 3 curies of cobalt 60, sealed, gamma radiography; 1 curie of radium as radium sulfate, unsealed, dial painting; 10 millicuries of carbon 14, tracer unsealed; 500 microcuries of iodine 131, tracer, unsealed; used annually - 1 curie; average quantity on hand - 10 millicuries.

Texas State Department of Health
Division of Occupational Health

STATE OF TEXAS
STATE DEPARTMENT OF HEALTH

REGISTRATION OF SOURCES OF RADIATION

Registration in compliance with Regulations on Radiation Exposure, adopted by the State Board of Health, effective September 1, 1956, under authority of Article 4418-d, Revised Civil Statutes, State of Texas. Registration does not imply approval or disapproval.

1. Owner-Name _____
   Address _____ (County) _____
2. Agent (Actual User) _____
   Address _____ (County) _____
3. Confines of Installation _____

4. RADIATION PRODUCING EQUIPMENT (Use Additional Sheets if Necessary)

TYPES OF RADIATION SOURCES	Number		Manufacturer, Model, Serial Number and General Location of Each Machine	Rating		Purpose or Use
	Fixed	Mobile		Kilovolts	Milliamps	
Medical or Dental X-Rays						
Industrial X-Rays						
Other* (Specify)						

*Other: Radioactive Static Eliminators, Beta Ray Gauges, Nuclear Reactors, Particle Accelerators, Electron Microscopes, etc.

5. RADIOACTIVE MATERIALS (Use Additional Sheets if Necessary)

DESCRIPTION	Estimated Quantity Used Annually	Average Quantity on Hand	Purpose or Use

Identify AEC License Held

6. Name and Address of Person in Charge of Radiation Protection

Qualifications _____

Date _____ Signature of Person in Charge of Radiation Protection _____

OH-R-1-1, September 1958

EXHIBIT 2

INFORMATIONAL BULLETIN

SIGNIFICANT RECENT CHANGES IN BASIC PHILOSOPHY ON MAXIMUM PERMISSIBLE RADIATION EXPOSURES TO MAN FROM EXTERNAL SOURCES

CONSULT LOCAL HEALTH DEPARTMENTS AND PHYSICIANS

FOR

INFORMATION AND ADVICE

ON METHODS OF CONTROL OVER

HEALTH HAZARDS TO ALL WORKERS

AND

INDUSTRIAL DISEASES AND INJURIES

TEXAS STATE DEPARTMENT OF HEALTH
DIVISION OF OCCUPATIONAL HEALTH
Austin 1, Texas

OH-1C
September 1958

42561 O—59——12

"The Texas State Department of Health shall make available to the citizens of Texas current information concerning minimum allowable concentrations of toxic gases and such environmental standards as may pertain to the health and safety of the employees of industrial establishments in this State." --- Article 4477-1, Section 19 (b), Revised Civil Statutes, State of Texas. I.

"Because of the impact of these changes and time required to modify existing equipment and installations it is recommended that on the basis of present knowledge that a conversion period of not more than five years from January, 1957 be adopted within which period all necessary modifications should be completed." [1]

SEE BULLETIN OH-1, "Regulations on Radiation Exposure", and OH-1-1, Amendment No. 1 to "Regulations on Radiation Exposure", Texas State Department of Health. This publication makes no change in the existing regulations; it advises compliance with the suggestions herein until such time as the regulations may be changed. II.

[1] National Committee on Radiation Protection

INFORMATIONAL BULLETIN

SIGNIFICANT RECENT CHANGES IN
BASIC PHILOSOPHY ON
MAXIMUM PERMISSIBLE RADIATION EXPOSURES
TO MAN FROM EXTERNAL SOURCES

I. SCOPE; PURPOSE; AVAILABILITY OF PERTINENT REFERENCES

1. Scope: Provides information regarding recent changes in the basic philosophy of the National Commission on Radiation Protection and Measurements regarding the maximum permissible dose to man from external sources. These changes will be incorporated into Occupational Health "Regulations On Radiation Exposure" when the National Bureau of Standards Handbook No. 59 is changed.

2. Purpose: The purpose of this bulletin is to provide for the users of ionizing radiation in Texas a guide, which by setting forth the revised philosophy on maximum permissible dose to man as issued by the National Commission on Radiation Protection and Measurements will enable the users of ionizing radiation to better plan for future operations and facilities.

3. Pertinent References: Copies of related laws, regulations, opinions of the Attorney General of Texas, Advisory Standards and procedural guides currently applicable will be provided to any citizen of Texas upon request.

II. DISCUSSION

On January 8, 1957, the National Committee on Radiation Protection and Measurements issued a Preliminary Statement setting forth its revised philosophy on Maximum Permissible Radiation Exposures to Man. Since that time several of the NCRP subcommittees have been actively studying the necessary revisions of their handbooks. An addendum dated April 15, 1958 explaining the new philosophy as it affects NBS Handbook 59 (permissible Dose from External Sources of Ionizing Radiation) has been incorporated as the first eight pages of that Handbook.

A summary of some of the "Basic Rules" included in these new concepts is noted below. For detailed information however, all parties employing ionizing radiation should obtain from the Superintendent of Documents, Washington 25, D.C., a copy of the NBS Handbook 59 with the new addendum (price 35 cents).

1. Exposure of Radiation Workers

a. Accumulated external exposure to critical organs. (whole body, head and trunk, active blood-forming organs, or gonads)

The maximum permissible dose (MPD), to the most critical organs, accumulated at any age, shall not exceed five (5) rems multiplied by the number of years beyond age 18, and the dose in any 13 consecutive weeks shall not exceed three (3) rems (Note that the old weekly dose limit is not used but in effect the new rule lowers the previously allowed 300 m rem/week to an average of 100 m rem/week).

b. Accumulated external exposure to other organs

Skin of whole body: MPD = 10 (N-18) rems, and the dose in any 13 weeks shall not exceed six (6) rems. (The philosophy here is the same as before, i.e., the permissible skin exposure is double the whole-body dose although the earlier rule made no statement regarding a 13-week limitation).

Lens of the eye: The dose to the lens of the eye shall be limited by the dose to the head and trunk -- see a above. (The lens of the eye has been found not to be as sensitive to radiation as previously thought).

Hands and forearms, feet and ankles: MPD = 75 rems/year, and the dose in any 13 consecutive weeks shall not exceed 25 rems. (This is basically the same as before except for the addition of the 13-week limitation).

c. Internal Exposures

Permissible levels from internal emitters have not been published but the recommended maximum permissible levels will be consistent with the age-proration principles above. This subject will be dealt with in detail in the forthcoming revision of NBS Handbook 52.

2. Emergency Dose to Radiation Workers

An accidental or emergency dose of 25 rems to the whole body or a major portion thereof, occuring only once in the lifetime of the person, need not be included in the determination of the radiation exposure status of that person. (This is the same as the rule currently employed).

3. Medical Dose to Radiation Workers

Radiation exposures resulting from necessary medical and dental procedures need not be included in the determination of the radiation exposure status of the person concerned. (This is the same as the rule currently employed).

4. Dose to Persons Outside of the Controlled Areas

The radiation or radioactive material outside a controlled area, attributable to normal operations within the controlled area, shall be

such that it is improbable that any individual will receive a dose of more than 0.5 rem in any one year from external radiation.

The maximum permissible average body burden of radionuclides in persons outside of the controlled area shall not exceed one-tenth of that for radiation workers. (This is basically the same as earlier recommendations, i.e., exposure to general population only one-tenth of the exposure to radiation workers).

The maximum dose of 12 rems in any one year as governed by the 13-week limitation, should be allowed only when adequate past and current exposure records exist. The records of previous exposures must show that the addition of such a dose will not cause the individual to exceed his age-prorated allowance. If adequate records are not available it must be assumed that the individual has received his age-prorated dose up to that time.

The new MPD standards are not intended to be applied retroactively to individuals exposed under previously accepted standards.

III. ACTION

The new "Basic Rules" discussed above are not yet officially part of Handbook 59 nor are they yet part of the State of Texas Department of Health Regulations on Radiation Exposure. Rather, they are an indication of things to come. When NBS Handbooks 52 and 59 are revised it is planned to incorporate their recommendations into the State regulations. Therefore it is suggested that this new philosophy on radiation exposure be incorporated into current planning and design so as to make the transition to the new standards as smooth as possible.

EXHIBIT 3

NATIONAL BUREAU OF STANDARDS HANDBOOKS APPLIED BY THE TEXAS STATE DEPARTMENT OF HEALTH

Handbook No.	Title	Date
42	Safe Handling of Radioactive Isotopes	September 1949
48	Control and Removal of Radioactive Contamination in Laboratories	December 15, 1951
49	Recommendations for Waste Disposal of Phosphorus-32 and Iodine-131 for Medical Users	November 2, 1951
50	X-ray Protection Design	May 9, 1952
51	Radiological Monitoring Methods and Instruments	April 7, 1952
52	Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water	March 20, 1953
53	Recommendations for the Disposal of Carbon-14 Wastes	October 26, 1953
54	Protection Against Radiations from Radium, Cobalt-60, and Cesium-137	September 1, 1954
55	Protection Against Betatron-Synchrotron Radiations Up to 100 Million Electron Volts	February 26, 1954
56	Safe Handling of Cadavers Containing Radioactive Isotopes	October 26, 1953
57	Photographic Dosimetry of X- and Gamma Rays	August 20, 1954
58	Radioactive-Waste Disposal in the Ocean	August 25, 1954
59	Permissible Dose from External Sources of Ionizing Radiation	September 24, 1954
60	X-ray Protection	December 1, 1955
61	Regulation of Radiation Exposure by Legislative Means	December 9, 1955
62	Report of the International Commission on Radiological Units and Measurements (ICRU) 1956	April 10, 1957
63	Protection Against Neutron Radiation up to 30 Million Electron Volts	November 22, 1957
64	Design of Free-Air Ionization Chambers	December 13, 1957

Handbook No.	Title	Date
65	Safe Handling of Bodies Containing Radioactive Isotopes (Supersedes Handbook 56)	July 10, 1958
66	Safe Design and Use of Industrial Beta-Ray Sources	May 28, 1958

EXHIBIT 4

Numerical Summary of
Radiation Registrants
In Texas

Ending April 30, 1959

	AEC Licensed Isotopes	X-rays	Radium	Reactors	Other Radiation Equipment	Total number of Classified items Registered
Industrial Concerns	182	68	159	2	28	439
Colleges, Universities and High Schools	45	24	8	2	4	83
State Agencies & Associations	4	6	1		1	12
City & County Agencies & Associations	3	30				33
Federal Agencies & Associations	11	19	11		2	43
Chiropractors		579				579
Veterinarians	1	111	2			114
Hospitals & Clinics	58	518	62		2	640
Dentists		1240	1			1241
M.D's & D.O's	57	721	57		1	836
Shoe-fitting fluoroscopes (56 reported not in use)		12				12
Chiropodists		13				13
Total number of Classified items Registered	361	3341	301	4	38	4045

Approximate number of registrations - 3637

EXHIBIT 5

EDUCATION AND TRAINING OF STAFF RELATED TO RADIOLOGICAL HEALTH

Name	Prior Preparation		Training in Last 3 Years
		Short Course	Visits & Short Courses
Engineer Directs Radiological Health Program	B.S.-C.E. M.S.-Engr. M.S.-Physics	6 wks course PHS, Cincinnati for Officers Special Rad. Health Course 2 series-Offsite Monitoring, PHS, Nevada Proving Ground 6 wks-Special Weapons Course, San Diego	Summer-Directed Offsite Monitoring Pacific Proving Ground Member-Health Physics Society 1 wk-Naval Rad. Def. Lab - San Francisco
Engineer*	B.S.-Ch.E.	1 wk-Civ. Def. Observer Nevada Proving Ground	4 wk-Basic Radiological Health & Lab, N.Y. 1 wk-Radiological Monitoring Short Course Nevada Post-Grad. Course in Rad.-Biology University of Kansas
Engineer	B.S.-Mining E.		2 wks-RATSEC-Basic Rad. Health 1 wk.-RATSEC-Nuc. Reactor Operation Extensive Army engineering experience in handling biological and chemical hazards.
Engineer	B.S.-P.E.	8 wks Offsite Monitoring-Nevada Proving Ground 1 wk PHS-Radiological Monitoring Washington 2 wk PHS Civ. Def. Course for PHS Officers, Washington	Post Grad. Course, University of Texas "Rad. Health"
Specialist	B.A.-Chem.		3 wks RATSEC-Basic Rad.Health & Air Sampling 1 wk Rad.Monitoring Short Course - Las Vegas
Specialist	B.A. Plan II Pre-Med		2 wks RATSEC-Basic Rad. Health
Chief Engineer	B.S.-Ch.E. M.S.-P.H.E.	2 wks-Radiological Warfare Def, RAFB 2 wks-PHS-Cincinnati-Basic Rad. Health	Member-Health Physics Society Attended 1958 Health Physics Conference-Berkeley Visited: U.C. Radiological Lab - Berkeley Naval Rad. Def. Lab - San Francisco G.E. Reactor Site - Vallecitos, Calif. Post Grad. Course, Univ. Texas, Radiochemistry Post Grad. Course, Univ. Texas, Rad. Health

*Absent in training

EXHIBIT 6

TEXAS STATE DEPARTMENT OF HEALTH
DIVISION OF OCCUPATIONAL HEALTH

SUMMARY OF ACTIVITIES
IONIZING RADIATION SECTION
SEPTEMBER 1958 - April 1959

Month	State Surveys	Joint AEC-State Inspections	Total Inspections	Lectures	Consl.	Total Services
Sept. 58	5	4	9	0	1	10
Oct. 58	5	11	16	0	1	17
Nov. 58	2	25	27	2	1	30
Dec. 58	1	25	26	0	1	27
Jan. 59	1	7	8	1	0	9
Feb. 59	4	10	14	0	1	15
March 59	19	0	19	1	4	24
April 59	18	0	18	8	9	35
	55	82	137	12	18	167

EXHIBIT 7

PROCEDURAL GUIDE

FOR

DIVISION OF OCCUPATIONAL HEALTH

REPORTED EXCESSIVE RADIATION DOSE

CONSULT LOCAL HEALTH DEPARTMENTS AND PHYSICIANS

FOR

INFORMATION AND ADVICE

ON METHODS OF CONTROL OVER

HEALTH HAZARDS TO ALL WORKERS

AND

INDUSTRIAL DISEASES AND INJURIES

TEXAS STATE DEPARTMENT OF HEALTH
DIVISION OF OCCUPATIONAL HEALTH
Austin 1, Texas

OH-1A
August 1958

"The Texas State Department of Health shall make available to the citizens of Texas current information concerning minimum allowable concentrations of toxic gases and such environmental standards as may pertain to the health and safety of the employees of industrial establishments in this State." --- Article 4477-1, Section 19(b), Revised Civil Statutes, State of Texas.

* *

NOTE: "Any accidental release of radioactive material beyond the control or jurisdiction of the installation shall be reported to the Agency immediately." -- Section 12(e), Regulations on Radiation Exposure, Adopted by the Texas State Board of Health, June 18, 1956.

* *

SEE PAGE 6

FOR EMERGENCY TELEPHONE NUMBERS

TO WHICH REPORT SHOULD BE MADE OF

EXCESSIVE RADIATION DOSE

CONTENTS

Subject

I. SCOPE; PURPOSE; DEFINITIONS; REFERENCES

II. DISCUSSION

1. Accidental Exposure; Reporting Them
2. Possible Origins of Excessive Radiation Dose
3. Those Things Which Can Be Done Usefully

III. PREPAREDNESS ACTIVITIES, DIVISION OF OCCUPATIONAL HEALTH

1. Within The Texas State Department of Health
2. Texas State Agencies Other Than Department of Health
3. Local (Other) Health Authorities
4. Technical Liaison Maintained
5. Communications

IV. PROCEDURES AT THE RADIATION SAFETY COMMAND POST (RADSAF CP)

1. Opening - Telephone Connections
2. Preparing Incident Report
3. Notifying Staff
4. Manning RADSAF CP
5. Duties
6. Activities of RADSAF CP

ANNEXES

I -- FIELD SURVEY TEAM EQUIPMENT LIST - EXCESSIVE RADIATION DOSE

II -- RADSAF CP EQUIPMENT LIST - EXCESSIVE RADIATION DOSE

III -- INCIDENT REPORT - EXCESSIVE RADIATION DOSE

IV -- JOURNAL OF REPORTS AND PROGRESS - EXCESSIVE RADIATION DOSE

V -- STAFF NOTIFICATION - EXCESSIVE RADIATION DOSE

PROCEDURAL GUIDE FOR

DIVISION OF OCCUPATIONAL HEALTH

REPORTED EXCESSIVE RADIATION DOSE

I. SCOPE; PURPOSE; AVAILABILITY OF PERTINENT REFERENCES

1. Scope: Provides guidance for handling any incident reported to the Texas State Department of Health, in which there has been actual or suspected "excessive radiation dose"; not designed as coverage for radiation exposures created by enemy action, although it is readily expansible to such.

2. Purpose: The purpose of this bulletin is to outline and prescribe the activities of the Division of Occupational Health, Texas State Department of Health in preparation for meeting readily a reported occurrence of actual or suspected "excessive radiation dose", or in responding most effectively with the resources currently available to the Division.

3. Definitions: (copied from Regulations on Radiation Exposure of the Texas State Board of Health.)

"Excessive radiation dose" is a dose of radiation in excess of maximum permissible dose.

"Maximum radiation dose" is a dose of radiation that, in the light of present knowledge, is not expected to cause appreciable bodily injury to a person at any time during his lifetime.

"Radiation" is gamma rays and x-rays, alpha and beta particles, high-speed electrons, neutrons, protons, and other nuclear particles; but not sound or radio waves, or visible, infrared, or ultraviolet light.

It is essential to know and apply all of the definitions and provisions contained in OH-1, Regulations on Radiation Exposure, 1956 (as amended), Texas State Department of Health.

4. Pertinent References: Copies of related laws, regulations, opinions of the Attorney General of Texas, Advisory Standards and procedural guides currently applicable will be provided to any citizen of Texas upon request.

II. DISCUSSION

1. Accidental Exposures; Reporting Them

Individual persons react differently to accidental and purposeful exposures to ionizing radiation. This makes all the more necessary the earliest possible estimate of the degree of radiation hazard to a person accidently exposed. Such estimate is very difficult at times, even by a qualified expert. However, most of our larger communities have

local citizens qualified to do this. If not, the State Department of Health usually can help, limited only by availability of its means. For that reason every citizen having knowledge of accidental exposure of himself or other person to excessive radiation dose should report the matter immediately, and by the quickest possible means, to the local health department, or where there is no local health department, to the local health officer, and both should make sure that it is reported to the Texas State Department of Health.*

2. Possible Origins of Excessive Radiation Dose

The origins of excessive radiation dose are likely to be from:

a. Non-enemy produced exposures (always possible)

(1) At a place of employment--from radioactive materials while they are being produced, encapsulated, received, stored, utilized, or moved.

(2) At a place of employment--where a reactor or a radiation machine is not controlled adequately.

(3) At some place along the route of a normally authorized transporting vehicle, created by an accident or by improper handling in or to or from:

(a) Automobile, truck, or trai..
(b) Airplane, missile, or helicopter
(c) Boat, ship, or submarine

(4) At any place(s)

(a) Due to deficient, irregular, or unauthorized activities related to production, encapsulation, hiding or storing, using, or moving, materials which are radioactive or can produce harmful radiation.
(b) Due to effects of a natural disaster liberating radiation normally kept under effective controls.

b. Enemy produced exposures by(continuously possible)

(1) Actual release of radiation by the attack itself, or as a result of radiation-carrying craft falling or becoming involved in other accident before it could attack.

(2) Combat (non-radiation attack) damage causing liberation of harmful radiation from our own radiation sources (normally safe until released by enemy produced damage).

---

*The term "accidental exposure" does not refer to diagnostic or therapeutic exposures of patients to radiation by licensed physicians and dentists.

(3) Disaster, secondary to enemy attack of any type, effects of which liberate excessive radiation dose normally kept under our own effective controls.

3. Those Things Which Can Be Done Usefully if excessive radiation dose should occur and will be reported appropriately, include:

a. Prior periodic planning, organizing, and training, all reviewed, revised, undertaken, in order to insure sufficient personnel and means and adequate procedures for:

(1) Prompt local responsive actions

(2) State-provided resources for aid and support, as required

b. State support and aid made immediately available; in Texas this is in limited amount from the Division of Occupational Health; no other organized State response is known or available to the Division.

III. PREPAREDNESS ACTIVITIES COMPLETED BY DIVISION OF OCCUPATIONAL HEALTH, TEXAS STATE DEPARTMENT OF HEALTH

1. Within the Texas State Department of Health

a. Procedural Guide (OH-1A) published (will be revised as required).

b. Procedural Guide (OH-1A) furnished all divisions of this Department.

c. Adequate training designed and ready for:

(1) Staff of Division of Occupational Health.

(2) Key staff trainers of all other divisions, arranged upon divisional request, and will be scheduled as mutually agreed.

d. Personnel availability (of the Division of Occupational Health) is maintained at all times.

e. Modern detection, identification and measurement equipment (see ANNEX I) for this Division (not for civil defense) and appropriate protective equipment have been procured and are:

(1) Maintained, repaired, and unserviceable batteries replaced.

(2) Calibrated, kept ready for immediate use.

f. Personnel staffing (supplements only, to serve in emergency functions) is solicited on a continuing basis from other divisions of the Department; if made available by respective Division Directors' authorization (for voluntary or directed participation), or if made available by Commissioner of Health's directive, or if supplementary personnel can be recruited outside the Department, such

supplementary personnel will be assigned, trained, scheduled, and assisted in their participation by the Division of Occupational Health.

g. Personnel staffing (supplementary) has been requested from the State Division of Defense and Disaster Relief through the Division of Emergency Medical Services, to permit maintaining the readiness of civil defense equipment and staff; this is essential both for prior training and for guiding local responses to enemy attack. Reply indicates that no aid can be made available to the Division of Occupational Health.

h. Adequate, current library reference materials are immediately available to the Division, and are supplemented periodically.

i. An adequate Radiation Safety Command Post (RADSAF CP) is available within the Division of Occupational Health and its equipment procured (see ANNEX II).

j. A summary report form for recording details of each reported excessive radiation dose is maintained at the RADSAF CP and at homes of the Division staff (see ANNEX III).

k. A journal of reports is maintained at the RADSAF CP (see ANNEX IV); incident periodic progress report and map overlays of levels of radiation for each incident are available and will be maintained in the permanent Journal; progress reports furnished to others will summarize the current status.

2. Texas State Agencies Other Than Department of Health

a. Procedural guide furnished every other State agency

b. Training is available to key staff trainers of all other State agencies, upon their request, and will be scheduled as mutually agreed.

c. Personnel staffing for each agency's emergency functions related to excessive radiation dose is urged and solicited; if made known to us we will coordinate with each State agency our plans and procedures.

d. We urge the minimal monitoring and survey capabilities indicated for the other agency personnel protection; we will provide individual agencies consultation and advice when requested.

e. We urge the minimal personal protective equipment and clothing indicated for agency personnel; we will provide consultation and advice when requested.

f. Each other State agency requiring it (e.g., Public Safety, Highway Department) will be furnished information of existing levels of incident radiation; if an agency Command Post (CP) will be

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available (on long-term basis) and we are requested so to do, and informed as to the proper contact(s), we will inform each CP of every confirmed reading as rapidly as we plot each.

3. Local (Other) Health Authorities

a. Procedural guide (OH-1A) furnished each local health officer and local health department, and will be sent to any other official or citizen who requests it.

b. Training is available to local key staff trainers upon request, and will be scheduled as mutually agreed.

c. An advisory guide (OH-1B) furnished to each local health department will be furnished also to any requesting local official or citizen.

4. Technical Liaison Maintained; Consultation and Aid Available to Us

a. United States Atomic Energy Commission (copies of this procedural guide furnished).

b. United States Public Health Service (copies of this procedural guide furnished).

c. Headquarters, Fourth United States Army (copies of this procedural guide furnished The Surgeon).

5. Communications

No separate means of communication are available to the Division of Occupational Health. Therefore, use of usual commercial telephone or telegraph are all that can be planned and recommended. No State priorities have been established to ensure that reporting of excessive radiation dose by commercial wire will be possible, especially in emergency.

In the event other communications means can be made available and adequate priorities established, this procedural guide will be amended accordingly.

IV. PROCEDURES AT THE RADIATION SAFETY COMMAND POST (RADSAF CP)

1. Opening

The Radiation Safety Command Post (RADSAF CP) is opened immediately in the Division of Occupational Health when a report is received from any reliable source that excessive radiation exposure has (or may have) occurred, and continues functional as long as necessary. The RADSAF CP is under direct control of the Director, Division of Occupational

Health. Telephone connection is available at all hours:

Department Office Hours:	Austin, Texas
8 A.M. - 5 P.M.	GReenwood 6-2681
Monday through Friday	Extension 44 or 74
Other than Office Hours:	GReenwood 6-1182
Saturday, Sunday, Holiday	
or	If no answer, call
Other Days: 5 P.M. - 8 A.M.	HOmestead 5-5437
	GReenwood 8-5355
	GLendale 2-1334

2. Preparing Incident Report

The Division staff member receiving a report completes immediately a summary of pertinent details (see ANNEX III).

3. Notifying Staff

Division staff members, starting with the first who receives and records a report, notify(ies) the appropriate people and agencies (ANNEX V).

4. Manning RADSAF CP

Division staff members report to the RADSAF CP as requested by the notifying staff member; first Division staff member to arrive at the State Department of Health opens the RADSAF CP.

5. Duties

All Division personnel remain at the RADSAF CP until their release is authorized by the Director, Division of Occupational Health.

6. Activities of RADSAF CP

The RADSAF CP staff will:

a. Receive and record all incident progress reports.

b. Plot and map on RADSAF CP operations maps the reported area(s) of radiation hazard.

c. When indicated, furnish local authorities on-the-ground assistance and advice by sending a Field Survey Team to the incident area.

d. Advise local authorities as to:*

(1) Our estimate of the level of radiation hazard, area involved, extent of damage, probable time radiation hazard will continue.

*See also OH-1B, Advisory Guide - Local Preparation For and Handling of Excessive Radiation Dose.

(2) Precautions they should take to insure protection of health.

(3) Methods of periodic local evaluation, and of reporting to us concerning the radiation.

(4) Decontamination measures they should undertake.

(5) Other activities, measures, means, consultation and advice of benefit, which are available and can be furnished.

e. Advise other State agencies, when requested, on procedures and means they may apply beneficially, or request such support(s), if indicated after consultation with local authorities and confirming such to be unavailable locally.

f. Furnish periodic (daily or more often) progress reports, as may be appropriate to:

(1) Other divisions of the State Department of Health.

(2) Other State agencies.

(3) Local officials, as indicated.

(4) U. S. Atomic Energy Commission

(5) U. S. Public Health Service

(6) Commanding General, Fourth U. S. Army

g. Request appropriate assistance if necessary from:

(1) U. S. Atomic Energy Commission

(2) U. S. Public Health Service

(3) Military authorities

TEXAS STATE DEPARTMENT OF HEALTH
DIVISION OF OCCUPATIONAL HEALTH

FIELD SURVEY TEAM EQUIPMENT LIST - EXCESSIVE RADIATION DOSE

1. Low Range Ionization Meters
2. High Range Ionization Meters
3. Geiger Counters with Headphones
4. Scintillation Meter
5. Proportional Alpha Counter
6. End Window Geiger Counter (Beta)
7. Dosimeters Self Reading: 0-200 mr, 0-20 r, 0-100 r
8. Pocket Chambers 0-200 mr
9. Charger Readers for above
10. Tongs
11. Lead Pig (Night Watchman has key to Basement Room)
12. Radiation Warning Signs
13. Portable Generator with Gas Cans
14. Wiring Harness, Extension Cords, Light Bulbs
15. Water Analysis Kit, Radiological
16. Air Sampling Kit

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FIELD SURVEY TEAM EQUIPMENT LIST - EXCESSIVE RADIATION DOSE (cont.)

17. Calibration Sources for Instruments
18. Spare Batteries for Instruments
19. Tool Kit
20. Flashlight and Spare Batteries
21. Note Book and Pencils
22. Coveralls
23. Gloves
24. Shoe Covers
25. Head Gear
26. Extra Spectacles if Worn
27. First Aid Kit
28. Snake Bite Kit
29. Water Canteen
30. Abrasive Soap
31. Maps Local
32. Pocket Knife

TEXAS STATE DEPARTMENT OF HEALTH
DIVISION OF OCCUPATIONAL HEALTH

RADSAF CP - EQUIPMENT LIST - EXCESSIVE RADIATION DOSE

1. Texas State Map (Sectional Aeronautical Charts), 1-500,000 Scale: Corpus Christi, San Antonio, Del Rio, El Paso, Austin, Beaumont, Dallas, Roswell, Albuquerque, Trinidad, Wichita, Oklahoma City
2. Texas General County Highway Map (one set)
3. Acetate Overlay Material (20 yds, 36" wide)
4. Wax Pencils, Red, Blue, Black (2 dozen each)
5. Acetate Cleaner (one quart)
6. Cotton Gauze
7. Typewriter, Desk, and Chair
8. Typewriter Paper, Carbon Paper, Thumb Tacks, Scotch Tape, Masking Tape, Erasers, Scratch Pads, Yard Sticks, Flash Lights
9. Pencils, 2H, 3H, HB (2 dozen each)
10. Library: References on Atomic Fallout, Radiation Safety, Health Physics
11. Record and Report (ANNEX III)
12. Journal Form and Binder (ANNEX IV)
13. Extracted List Telephone Numbers (ANNEX V)
14. Folding Aluminum Ladder, 4'
15. Fallout Templates and Scales

ANNEX II - RADSAF CP - EQUIPMENT LIST - EXCESSIVE RADIATION DOSE

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August 1958

TEXAS STATE DEPARTMENT OF HEALTH
DIVISION OF OCCUPATIONAL HEALTH

Circle Pertinent Word
Fill in All Blanks
NA- Not Applicable
U - Unknown

Incident No. _____
(entered by Adm. Clerk)
(Date entered _____)

Hour _____ AM PM

Excessive Radiation Dose

Date _____

Suspected
Confirmed

Report Received by

1. Informant's Name: _____ (Staff Member)

Received at Office _____
Home _____ Other _____

Address: _____
City County

Telephone: _____

2. Official (other) Position of Informant: _____

3. Location of Incident: _____
City County

4. Exact Area Involved (Streets, County Area): _____

5. Amount/Type of Contaminating Radiation Material: _____

6. How Did Incident Occur? Date: _____ Hour: _____

Other Details (including actions already taken, e.g., decontamination): _____

7. Number of People Exposed: _____

8. Type of Exposure: _____

9. Names of Victims Known: Yes No Recorded by Informant? Yes No

10. Number and Names of Dead Known: Yes No U NA

SEE REVERSE

OH-1A ANNEX III - INCIDENT REPORT - EXCESSIVE RADIATION DOSE
August 1958

11. What Local Authority Has Been Notified?

Name: _____ Position: _____

Telephone Number: _____

12. What Local Authority Is In Charge Now?

Name: _____ Position: _____

Telephone Number: _____

13. Will You Tell Him (12, above) To Call Us Immediately So We Can Agree Upon Assistance We Can Give? Yes No

14. Time Local Authority In Charge Called: _____ AM / PM
Date and Hour

15. What Immediate Assistance from Us Required? List: _____

_____

16. Will Local Authority Report to Us When Additional Assistance Is Needed? Yes No

17. Other Agencies Notified by Local Authority:

State: _____/None

_____

Federal: _____/None

_____

18. What Assistance Promised by Other Agency(ies)? _____

_____

_____

_____

19. Has Local Authority Set Up Barrier Lines to Prohibit Entry and Possible Exposure(s) in Affected Area? Yes No

20. Will Local Authority Obtain Local, Qualified Expert Advice to Evaluate Hazards? Yes No Control Handling? Yes No

Who Is It? _____
Name

_____
Telephone Number

21. Reported above to Director, Division of Occupational Health _____ AM / PM

Date: _____ _____

TEXAS STATE DEPARTMENT OF HEALTH
DIVISION OF OCCUPATIONAL HEALTH

JOURNAL OF REPORTS AND PROGRESS - EXCESSIVE RADIATION DOSE

Incident No. _____ Place: _____

Progress Report No.:_____ Date: _____ Prepared By: _____

Source of Information: _____

Distribution of Copies: _____, _____, _____

_____, _____, _____

1. Status of Exposed Personnel: _____

_____

_____

2. Current Areas of Contamination - Show on Overlay the Radiation Levels, Date and Times of Reading: _____

_____

_____

3. Decontamination Progress (Show on Overlay - Indicate Methods): _____

_____

_____

_____

_____

_____

4. Brief Listing of Personnel and Equipment Being Used: _____

_____

_____

5. Other Pertinent Information: _____

_____

_____

_____

OH-1A ANNEX IV - JOURNAL OF REPORTS AND PROGRESS - EXCESSIVE RADIATION DOSE
August 1958

TEXAS STATE DEPARTMENT OF HEALTH
DIVISION OF OCCUPATIONAL HEALTH

STAFF NOTIFICATION
EXCESSIVE RADIATION DOSE

1. First staff member receiving reported incidence of excessive radiation dose informs:

   Director, Division of Occupational Health GLendale 2-1334

2. Director, Division of Occupational Health, according to nature of incident will inform/cause to be informed:

   a. Texas State Department of Health

   Other staff members, Division of Occupational Health

   Director, Division of Public Health Education HIckory 2-5434

   Legal Consultant HOmestead 5-6307

   Commissioner of Health
   (and if he directs)

   Other Division Directors

Emergency Medical Services	GLendale 3-1594
Water Pollution Control	HOmestead 5-5531
Sanitary Engineering	GReenwood 7-2070
Veterinary Public Health	GLendale 2-1569
Food and Drugs	HOmestead 5-0213
Laboratories	GLendale 3-4202
Local Health Services	GReenwood 8-8263

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b. Other State Agencies (call regular numbers during duty hours)

Texas Department of Public Safety		HOmestead 5-5471
Highway Department		
Mr. J. A. Shelby		GLendale 3-1949
Mr. W. R. Welty		GReenwood 8-3505 GReenwood 8-4568
Mr. Richard Oliver		HOmestead 5-0703

c. Federal Agencies

U. S. Atomic Energy Commission		Albuquerque ALpine 6-4411 Ext. 3-8267 or 3-8268
Public Health Service, Dallas	Day Other Hours	RIverside 8-5611, Ext. 455 EMerson 1-4181
Fourth U. S. Army		San Antonio CApitol 2-8411
Staff Duty Officer		Ext. 2745 - All Hours
Surgeon	Day Other Hours, ask for Surgeon	Ext. 3101

d. Local Health Department Concerned

e. Local Health Officers Concerned

NOTE: Local health (other) officials are urged to not use the above to duplicate reporting. This, naturally, does not prevent liaison between local civil authorities and commanders of nearby military installations in the normally accepted manner. All are urged to avoid confusing excessive radiation dose reporting and activities with those of civil defense.

EXHIBIT 8

ADVISORY GUIDE

LOCAL PREPARATIONS FOR AND HANDLING

OF

EXCESSIVE RADIATION DOSE

CONSULT LOCAL HEALTH DEPARTMENTS AND PHYSICIANS

FOR

INFORMATION AND ADVICE

ON METHODS OF CONTROL OVER

HEALTH HAZARDS TO ALL WORKERS

AND

INDUSTRIAL DISEASES AND INJURIES

TEXAS STATE DEPARTMENT OF HEALTH
DIVISION OF OCCUPATIONAL HEALTH
Austin 1, Texas

OH – 1B
August 1958

"The Texas State Department of Health shall make available to the citizens of Texas current information concerning minimum allowable concentrations of toxic gases and such environmental standards as may pertain to the health and safety of the employees of industrial establishments in this State."--- Article 4477-1, Section 19(b), Revised Civil Statutes, State of Texas.

* *

NOTE: "Any accidental release of radioactive material beyond the control or jurisdiction of the installation shall be reported to the Agency immediately." -- Section 12(e), Regulations on Radiation Exposure, Adopted by the Texas State Board of Health, June 18, 1956.

* *

EMERGENCY TELEPHONE NUMBERS

TO WHICH REPORT SHOULD BE MADE OF

EXCESSIVE RADIATION DOSE

	Austin, Texas
Department Office Hours: 8 A.M. - 5 P.M. Monday through Friday	GReenwood 6-2681 Extension 44 or 74
Other than Office Hours: Saturday, Sunday, Holiday	GReenwood 6-1182
or	If no answer, call
Other Days: 5 P.M. - 8 A.M.	HOmestead 5-5437 GReenwood 8-5355 GLendale 2-1334

ANNEXES

I - SUGGESTED STAFFING FOR LOCAL RADSAF CP - EXCESSIVE RADIATION DOSE

II - SUGGESTED STAFFING FOR LOCAL FIELD SURVEY TEAMS - EXCESSIVE RADIATION DOSE

III - SUGGESTED STAFFING FOR LOCAL RADIOLOGICAL DECONTAMINATION TEAMS - EXCESSIVE RADIATION DOSE

IV - SUGGESTED LOCAL RADSAF CP EQUIPMENT LIST - EXCESSIVE RADIATION DOSE

V - SUGGESTED LOCAL FIELD SURVEY TEAM EQUIPMENT - EXCESSIVE RADIATION DOSE

VI - SUGGESTED LOCAL RADIOLOGICAL DECONTAMINATION TEAM EQUIPMENT LIST - EXCESSIVE RADIATION DOSE

VII - SUGGESTED LOCAL INCIDENT REPORT - EXCESSIVE RADIATION DOSE

VIII - SUGGESTED LOCAL JOURNAL OF REPORTS AND PROGRESS - EXCESSIVE RADIATION DOSE

IX - SUGGESTED LOCAL LIST OF PEOPLE OR AGENCIES TO INFORM OF EXCESSIVE RADIATION DOSE - EXCESSIVE RADIATION DOSE

ADVISORY GUIDE

LOCAL PREPARATION FOR AND HANDLING

OF

EXCESSIVE RADIATION DOSE

I. SCOPE; PURPOSE; DEFINITIONS; AVAILABILITY OF PERTINENT REFERENCES

1. Scope: Provides advice for local handling of an incident in which there has been actual or suspected "excessive radiation dose;" not designed as coverage for radiation exposures created by enemy action, it is readily adaptable for such.

2. Purpose: The purpose of this bulletin is to outline suggested activities for local authorities and others interested in those local preparations required to meet readily a reported occurrence of actual or suspected "excessive radiation dose," or to respond most effectively with the resources currently available for the purpose.

3. Definitions: (copied from Regulations on Radiation Exposure):*

"Excessive radiation dose" is a dose of radiation in excess of maximum permissible dose.

"Maximum permissible dose" is a dose of radiation that, in the light of present knowledge, is not expected to cause appreciable bodily injury to a person at any time during his lifetime.

"Radiation" is gamma rays and x-rays, alpha and beta particles, high-speed electrons, neutrons, protons, and other nuclear particles; but not sound or radio waves, or visible, infrared, or ultraviolet light.

All local authorities should know and apply all of the definitions and provisions contained in OH-1, Regulations on Radiation Exposure, 1956 (as amended), Texas State Department of Health.

4. Pertinent References: Copies of related laws, regulations, opinions of the Attorney General of Texas, Advisory Standards and procedural guides currently applicable will be provided to any citizen of Texas upon request.

II. DISCUSSION

1. Accidental Exposures; Reporting Them

Individual persons react differently to accidental and purposeful exposures to ionizing radiation. This makes all the more necessary the earliest possible estimate of the degree of radiation hazard to a person who

*The Division of Occupational Health, Texas State Department of Health, is charged with administration of Regulations on Radiation Exposure adopted by the Texas State Board of Health, June 18, 1956.

is accidently exposed. Such estimate is very difficult at times, even by a qualified expert. For that reason every citizen having knowledge of accidental exposure of himself or other person to excessive radiation dose should report the matter immediately, and by the quickest possible means, to the local health department, or where there is no local health department, to the local health officer, and both should make sure that it is reported to the Texas State Department of Health.*

Most of our larger communities have local citizens qualified to do this. If not, the State Department of Health can help. The Texas Medical Association's Committee on Nuclear and Atomic Medicine advises the physicians of Texas on radiation. Personal physicians can contact a member of this Committee for advice when desired. Every person exposed excessively, or possibly so, should seek immediate care of his personal physician.

2. Possible Origins of Excessive Radiation Dose

The origins of excessive radiation dose are likely to be from:

a. Non-enemy produced exposures (always possible) at

(1) A place of employment--from radioactive materials while they are being produced, encapsulated, received, stored, utilized, or moved.

(2) A place of employment--where a reactor or a radiation machine is not controlled adequately.

(3) Some place along the route of or in a normally authorized transporting vehicle, created by an accident or by improper handling in or to or from:

(a) Automobile, truck, or train
(b) Airplane, missile, or helicopter
(c) Boat, ship, or submarine

(4) Any place(s) due to deficient, irregular, or unauthorized activities related to production, encapsulation, hiding or storing, using, or moving, materials which are radioactive or can produce harmful radiation.

(5) Any place(s) due to damage by natural disaster which would liberate harmful radiation from sources normally under effective control (e. g., fire, flood, earthquake, tornado).

b. Enemy produced exposures (currently possible) by

(1) Actual release of radiation by the attack itself, or by craft carrying radiation and falling or involved in other accident before it could attack.

(2) Combat (non-radiation attack) damage to, and liberation of harmful radiation from, our own radiation sources (normally safe until released by enemy produced damage).

*The term "accidental exposure" does not refer to diagnostic or therapeutic exposures of patients to radiation by licensed physicians and dentists.

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(3) Disaster, secondary to and caused by enemy attack of any type, effects of which liberate excessive radiation dose normally kept under effective controls.

3. Those Things Which Can Be Done Usefully if excessive radiation dose should occur and will be reported appropriately, include:

a. Prior local periodic planning, organizing, and training, all reviewed, revised, undertaken to ensure sufficient personnel and means and adequate procedures for:

(1) Prompt local responsive actions

(2) Acceptance and most effective utilization of state-provided resources of aid and support.

b. Provision of State support and aid; these can be made available to local authorities more immediately and effectively if all prior planning will have been coordinated between state and local authorities and mutually agreed at the time of preparation.

4. Local Variations

Local circumstances vary so much that each local plan, organization, and function must be individually designed. If advice and suggestions are required or desired, requests should be submitted to the Division of Occupational Health, Texas State Department of Health.

III. PLANNING SUGGESTIONS FOR LOCAL HEALTH DEPARTMENTS PREPAREDNESS ACTIVITIES

1. Responsibility

Officially designate one responsible local agency for all actions regarding incidents involving excessive radiation exposure.

2. Authority

Provide simple, clear, local authority to the designated agency to cover its mission(s).

3. Means

Provide personnel required (ANNEXES I, II, III) and the means required (ANNEXES IV, V, VI) for local response when an excessive radiation dose is reported or occurs.

4. Local Procedural Guide

Prepare a local procedural guide clearly delineating responsibilities by name(s), actions, and duties of local staff members, and detailing the means for accomplishing their assigned mission(s).

5. Supplemental Means

Prepare list of supplemental means and personnel which, if unavailable, should be requested from others. (Prepare a local ANNEX listing details - advice is available if desired - see Section II-4, preceding).

IV.

6. Communications

Provide for immediate communication to the State Department of Health confirmed information regarding an excessive radiation exposure (see suggested ANNEX VII for details to be reported).

7. Local RADSAF CP

Provide a specific place for and establish and equip a RADSAF CP to serve in the receipt, evaluation, and recording of information so that proper decisions with the benefit of complete information can be made by the designated local authority.

8. Report and Journal Forms

Prepare forms for "Report of Incident" (ANNEX VII) and a "Journal of Reports" (ANNEX VIII) for the local RADSAF CP.

9. Training

Train local personnel, augmenting agency staffs with individuals recruited from local professional, educational, and industrial groups for staffing the local RADSAF CP.

10. Reference Material

Keep available adequate library for ready reference in training or in actual functions of radiation safety, health physics, fallout, and decontamination.

11. Local Notifications

Establish a list of people, agencies, and communities to be informed of incident. (See suggested ANNEX IX.)

IV. SUGGESTED PROCEDURES FOR LOCAL HEALTH DEPARTMENTS AT THE RADIATION SAFETY COMMAND POST (RADSAF CP)

1. The local Radiation Safety Command Post (RADSAF CP) is opened immediately when a report is received from any reliable source that excessive radiation exposure has (or may have) occurred, and continues functional as long as necessary. The local RADSAF CP is under direct control of the Director, Local Health Department.

List the telephone connection available at all hours, e. g.:

Local Health Department _____, Texas

Office Hours:
8 A.M. - 5 P.M.
Monday through Friday _____

If no answer, call:

Holidays; _____

Other Days: 5 P.M. - 8 A.M. _____

_____

_____

2. The Local Health Department staff member receiving a report completes immediately a summary of pertinent details (ANNEX VII - INCIDENT REPORT - EXCESSIVE RADIATION DOSE).

3. Local Health Department staff members, starting with the first who receives and records a report, notify(ies) the appropriate people and agencies (ANNEX IX).

4. Local Health Department staff members report to the RADSAF CP as requested by the notifying staff member; first staff member to arrive opens the RADSAF CP.

5. All staff personnel remain at the RADSAF CP until their release is authorized by the Director, Local Health Department.

6. The local RADSAF CP staff will

   a. Receive and record all incident progress reports

   b. Plot and map on local RADSAF CP operations map the reported area(s) of radiation hazard

   c. Send a Field Survey Team to the incident area for monitoring, sampling, delineating areas of contamination, determining and reporting levels of radiation, and to furnish on-the-ground assistance and advice concerning the radiation and rescue work.

   d. Keep the State Department of Health adequately informed regarding progress in the incident

   e. Advise other agencies as to

      (1) Estimate of the level of radiation hazard, area involved, extent of damage, probable time radiation hazard will continue

      (2) Precautions to be taken to ensure protection of health

      (3) Decontamination measures to be undertaken

      (4) Other activities, measures, means, consultation and advice of benefit, which are available and can be furnished

   f. Advise State agencies on procedures and means they may apply beneficially, or request such support(s) if it is indicated and confirmed that these are unavailable locally

   g. Furnish periodic (daily or more often) progress reports, as may be appropriate to:

      (1) Other local officials, as indicated

(2) The State Department of Health

h. Request appropriate assistance if necessary from

(1) Texas State Department of Health

V. TRAINING

The Texas State Department of Health, Division of Occupational Health will organize and furnish training courses for local key staff trainers (not team members) in all phases of response to excessive radiation dose, at times and places mutually established for each course. The Division of Training, Texas State Department of Health, is available to aid local authorities in organization of training courses.

VI. TESTING

Local authorities should conduct careful tests as frequently as required to ensure proficiency and readiness of the local organization for the assigned mission(s). The State Department of Health Division of Occupational Health, in coordination with the Division of Training and other interested divisions, with prior mutual arrangements, will aid either by local consultation, advice and critiques on local tests, or will participate by receiving "test" reports.

SUGGESTED STAFFING FOR LOCAL RADSAF CP

LOCAL HEALTH DEPARTMENT

The RADSAF CP, when opened and in operation, will require 24 hour manning. The Director of the Local Health Department should be responsible for actions and operations of the CP. The Director should have as his assistants for full time CP operation, sufficient numbers of qualified personnel who may be from his organization or from local industrial, educational, or professional groups. The assistants should be trained in receipt of reports, and in basic knowledge of radiation detection, health physics, decontamination, and fallout problems, including plotting of radiation contours. Each team must have readily available those items of equipment listed in ANNEX IV or equivalent to meet local requirements.

Current telephone numbers of all CP Staff members should be readily available to the director and his staff.

SUGGESTED STAFFING FOR LOCAL FIELD SURVEY TEAMS

LOCAL HEALTH DEPARTMENT

A Field Survey Team should consist of one or more persons trained in radiation detection, monitoring, decontamination, and minimal health physics. Teams may be obtained from the staff of the Local Health Department or from qualified industrial, educational, and professional groups. Each team must have readily available those items of equipment listed in ANNEX V modified to the extent the director of the local health department determines necessary to fulfill his mission.

OH-1B ANNEX II - SUGGESTED STAFFING FOR LOCAL FIELD SURVEY TEAMS - EXCESSIVE RADIATION DOSE

SUGGESTED STAFFING FOR LOCAL RADIOLOGICAL DECONTAMINATION TEAM

LOCAL HEALTH DEPARTMENT

A decontamination team should consist of two or more persons trained in Radiological Decontamination. They should have basic knowledge of decontamination procedures and materials and be able to use basic radiation detection instruments. Teams may be obtained from the local health staff or qualified industrial or municipal groups. Each team should have readily available equipment and materials listed in ANNEX VI, modified to the extent the director of the local health department determines necessary to fulfill his mission.

Supplemental means are more than likely to be required. For example, bull-dozers, graders, and like equipment demand clear understanding of objectives of decontamination.

OH-1B ANNEX III - SUGGESTED STAFFING FOR LOCAL RADIOLOGICAL DECONTAMINATION TEAMS - EXCESSIVE RADIATION DOSE

SUGGESTED LOCAL RADSAF CP EQUIPMENT LIST

LOCAL HEALTH DEPARTMENT

1. Texas State Map 1-500,000 Scale

   Section Aeronautical Charts:* Corpus Christi, San Antonio, Del Rio, El Paso, Austin, Beaumont, Dallas, Roswell, Albuquerque, Trinidad, Wichita, Oklahoma City

2. General County Highway Map and City Map

3. Acetate Overlay Material

4. Wax Pencils, Red, Blue, Black (1 dozen each)

5. Acetate Cleaner (1 quart)

6. Cotton Gauze

7. Typewriter, Desk, and Chair

8. Typewriter Paper, Carbon Paper, Thumb Tacks, Scotch Tape, Masking Tape, Erasers, Scratch Pads, Yard Sticks, Flash Lights

9. Pencils, 2H, 3H, HB (2 dozen each)

10. Library: References on Atomic Fallout, Radiation Safety, Health Physics

11. Record and Report (ANNEX VII)

12. Journal Form and Binder (ANNEX VIII)

13. Extracted List Telephone Numbers (ANNEX IX)

14. Folding Aluminum Ladder, 4'

15. Fallout Templates and Scales

*The sections covering the local area and adjoining areas are essential, others are desirable.

SUGGESTED LOCAL RADIATION FIELD SURVEY TEAM EQUIPMENT LIST

LOCAL HEALTH DEPARTMENT

Minimum equipment for evaluating excessive radiation dose

1. Geiger Counters With Earphones
2. Low Range Rate Meters
3. High Range Rate Meters
4. End Window Geiger Counter
5. Protective Clothing
6. Radiation Markers
7. Self-reading Dosimeters, 0-200mr, 0-20r

OH-1B ANNEX V - SUGGESTED LOCAL FIELD SURVEY TEAM EQUIPMENT - EXCESSIVE RADIATION DOSE

SUGGESTED LOCAL RADIOLOGICAL DECONTAMINATION TEAM EQUIPMENT LIST

LOCAL HEALTH DEPARTMENT

1. Protective Clothing, Boots, Headgear
2. Low Range Rate Meters
3. High Range Rate Meters
4. Dosimeters and Chargers
5. Brushes
6. Brooms
7. Buckets
8. Packaged Detergents
9. Soap Powder
10. Garden Hose With Nozzles
11. Shovels
12. Vacuum Cleaners

OH-1B ANNEX VI - SUGGESTED LOCAL RADIOLOGICAL DECONTAMINATION TEAM EQUIPMENT LIST - EXCESSIVE RADIATION DOSE

SUGGESTED LOCAL INCIDENT REPORT

LOCAL HEALTH DEPARTMENT

Circle Pertinent Word
Fill in All Blanks
NA - Not Applicable
U - Unknown

Hour _____ AM PM

Excessive Radiation Dose

Suspected

Confirmed

Date _____

Reported to Texas State Department of Health

_____
Name of Person

1. Informant's Name: _____ At his/her Office _____ Home _____
_____ Other _____

Address: _____
City County

Telephone: _____

2. Official (other) Position of Informant: _____

3. Location of Incident: _____
City County

4. Exact Area Involved (Streets, County Area): _____

_____

5. Amount/Type of Contaminating Radiation Material: _____

_____

6. How Did Incident Occur? Date: _____ Hour: _____

Other Details (including actions already taken, e.g., decontamination): _____

_____

_____

_____

7. Number of People Exposed: _____

8. Type of Exposure: _____

9. Names of Victims Known: Yes No Recorded by Informant: Yes No

10. Number and Names of Dead Known: Yes No U NA

SEE REVERSE

OH-1B ANNEX VII - SUGGESTED LOCAL INCIDENT REPORT - EXCESSIVE RADIATION DOSE

11. Local Authority Who Has Been Notified?

Name:_____ Position:_____

Telephone Number:_____

12. Local Authority Reported To Be In Charge Now?

Name:_____ Position:_____

Telephone Number:_____

13. Told Him (12, above) To Call Texas State Department of Health Immediately So As To Agree Upon Assistance They Can Give? Yes No

14. Time Local Authority in Charge Called_____ AM PM
(If Known) Date and Hour

15. What Immediate Assistance Was Reported To Be Required? List:_____

_____

16. Local Authority Will Report When Additional Assistance Is Needed? Yes No

17. Other Agencies Notified by Local Authority:

State:_____ /None

_____

Federal:_____ /None

_____

18. What Assistance Promised by Other Agency(ies)?_____

_____

_____

_____

19. Has Local Authority Set Up Barrier Lines to Prohibit Entry and Exposure in Affected Area? Yes No

20. Will Local Authority Obtain Local, Qualified Expert Advice to Evaluate Hazards? Yes No Control Handling? Yes No

Who Is It?_____

_____
Telephone Number

SUGGESTED LOCAL JOURNAL OF REPORTS AND PROGRESS

LOCAL HEALTH DEPARTMENT

Incident No;_____

Report No:_____ Date:_____ Prepared by:_____

Source of Information:_____

Distribution of Copies:_____,_____,_____

_____,_____,_____

1. Status of Exposed Personnel:_____

_____

_____

2. Current Areas of Contamination (Show on Overlay if Needed) and Radiation Levels

_____

_____

_____

3. Decontamination Progress (Show on Overlay if Needed):_____

_____

_____

4. Brief Listing of Personnel and Equipment Being Used:_____

_____

_____

5. Other Pertinent Information:_____

_____

_____

OH-1B ANNEX VIII - SUGGESTED LOCAL JOURNAL OF REPORTS AND PROGRESS - EXCESSIVE RADIATION DOSE

SUGGESTED LOCAL LIST OF PEOPLE OR AGENCIES
TO
INFORM OF EXCESSIVE RADIATION DOSE

LOCAL HEALTH DEPARTMENT

1. Local Authorities
   a. Mayor or City Manager: _____
   b. Police Department: _____
   c. Fire Department: _____
   d. Hospitals: _____
   e. District Office of Highway Department: _____
   f. District/Regional Office of Public Safety: _____
2. Texas State Department of Health, Division of Occupational Health
3. List of persons who will augment local health department staff
   a. Local RADSAF CP staff

Name	Phone Number
_____	_____
_____	_____
_____	_____
_____	_____

   b. Local Field Survey Teams

Name	Phone Number
_____	_____
_____	_____
_____	_____
_____	_____

   c. Local Radiological Decontamination Teams

Name	Phone Number
_____	_____
_____	_____
_____	_____

EXHIBIT 9

COMMUNITIES AND COUNTIES IN TEXAS WHERE ACCIDENTS INVOLVING USE AND TRANSPORTATION OF ATOMIC MATERIALS MIGHT OCCUR

CONSULT LOCAL HEALTH DEPARTMENTS AND PHYSICIANS

FOR

INFORMATION AND ADVICE

ON METHODS OF CONTROL OVER

HEALTH HAZARDS TO ALL WORKERS

AND

INDUSTRIAL DISEASES AND INJURIES

TEXAS STATE DEPARTMENT OF HEALTH
DIVISION OF OCCUPATIONAL HEALTH
Austin 1, Texas

OH-25
April 1958

"The Texas State Department of Health shall make available to the citizens of Texas current information concerning minimum allowable concentrations of toxic gases and such environmental standards as may pertain to the health and safety of the employees of industrial establishments in this State." ---Article 4477-1, Section 19(b), Revised Civil Statutes, State of Texas.

Communities and Counties in Texas Where Accidents Involving Use and Transportation of Atomic Materials Might Occur

by W. L. Wilson, M.D., Director, and Martin C. Wukasch, P.E., Associate Director (Engineering), Division of Occupational Health, Texas State Department of Health, Austin, Texas.

Delivered before Symposium on Medical Emergencies and Problems Associated with Peaceful Uses of Atomic Energy, Texas Medical Association, Shamrock-Hilton Hotel, Houston, Texas, April 19, 1958.

Communities and Counties in Texas Where Accidents Involving Use and Transportation of Atomic Materials Might Occur[1]

by

W. L. Wilson, M.D., and Martin C. Wukasch, P.E.[2]

The Texas State Department of Health is required by law to evaluate adequacy of health protection at and in industrial establishments and other places of employment. To meet this charge effectively Doctor Henry A. Holle, your Commissioner of Health, established the Division of Occupational Health on September 1, 1956. Previous experience proved the necessity of a full time program specifically directed to occupational health hazards which are continuously increasing in frequency and intensity for agricultural as well as industrial and other urban employees. Examples could be cited of the increased use of insecticides, defoliants, and chemical fertilizers on the farm or economic poisons on ranches, now contributing a greater share of acute and chronic toxic exposures than ever before. Similarly we could mention the increased number of chemical plants, or manufacturing establishments, all presenting problems involving exposures from fumes, vapors, gases, dusts, and mists. If there is any one broad cause for increased responsibility it is the fact that our whole environment has become one of ever increased exposures due to our "chemical age."

The extent and distribution of some of the industrial and commercial occupational health problems are easy to illustrate. Urbanization in Texas is increasing rapidly (Figure 1). There are now 18 counties having cities with 50,000 population or more. Going along with this as might be expected is a concentration of manufacturing plants (Figure 2). While we select for illustration only those counties having over 130 manufactories, some may be surprised to learn that Texas has nearly eleven thousand in 808 of the 872 incorporated cities and towns. Dallas County leads Harris County in total number of establishments, yet the reverse is true in terms of total population employed or larger plants (employing more than 250 persons).

All people are in continual need of the protection available from public health programs. However, every normal adult employee is influenced particularly by emotional and physical stresses related quantitatively to his area of employment, for example by the greater focal points of concentrated occupational problems (Figure 3).

In crude oil production accidents from tools, moving equipment, and falls provide a major source of occupational health problems (Figure 4). In addition there are health hazards from fires, explosions, and exposure to hydrogen sulfide gas which has too frequently taken its toll among oil well drillers. At this point we should recall that the non-health aspects of occupational accident

[1]Delivered before Symposium on Medical Emergencies and Problems Associated with Peaceful Uses of Atomic Energy; Texas Medical Association, Shamrock-Hilton Hotel, Houston, Texas, April 19, 1958.

[2]Director, Associate Director (Engineering) respectively, Division of Occupational Health, Texas State Department of Health, Austin, Texas.

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prevention and of employee safety are a responsibility of our State Bureau of Labor Statistics. Hence we strive to correlate with that Agency our health protection activities. Workers of oil well and oil field equipment plants have accidents from manufacturing and transportation of the products (Figure 5). In petroleum refineries will be found a wide gamut of problems, among which are exposures to carcinogenic compounds, volatile hydrocarbons, and combustible products (Figure 6).

Closely related to petrochemical production in a variety of hazards organic chemical plants provide many of the problems previously mentioned (Figure 7). Frequently they are struggling manfully also with community air pollution problems. Inorganic chemical plants add to the exposure list. Corrosive acids and alkalies; toxic fluorine and sulfur compounds are only a few (Figure 8).

All of the previous plants operate maintenance and repair shops. In addition to such hazards thus created hazards from spray painting and welding are prevalent in automotive assembly and manufacturing plants (Figure 9). Common to marine transportation plants as well as to all other industrial operations are the problems associated with illumination, ventilation, temperature, and humidity (Figure 10). Aircraft and missile manufacturing operations give us excellent examples of one of the newer problems given impetus through compensation consideration - namely noise evaluation and control, and the occupational conservation of hearing (Figure 11). Here too problems have been introduced which lie in both the chemical and radiation realms, with examples in machinery operations on magnesium-thorium alloys and experimentation on nuclear propulsion.

The susceptible populations, their locations, types of work, and some basic epidemiological factors have been presented to prepare the way for closer examination of new hazards from radiation, which can be profitably and effectively superimposed upon many types of employment. Concurrent with the establishment of a Division of Occupational Health, new Regulations on Radiation Exposure had been adopted and promulgated by the Texas State Board of Health. The necessity for such control was cited in an address by Doctor Henry A. Holle only two days ago at a Symposium on Atomic Energy in Dallas, sponsored by the Southwestern Legal Foundation. In addition to tracing developments by the Governor's Texas Advisory Committee on Atomic Energy, which recommended the establishment of the regulations, Doctor Holle cited case histories involving unnecessary trauma resulting from excessive radiation exposure in Texas. Included were injuries sustained by dentists, physicists, hospital technicians, and physicians. Among the latter profession were losses of ears, fingers, and hands, deaths from leukemia, and incidences of malignancies. To support these specific cases was the knowledge that the effects of ionizing radiation are cumulative and irreversible. Prevention of damage through any feasible and reasonable method is essential, for we cannot wait until there are obvious signs of radiation trauma or property damage. Then we may be too late to aid an affected population or be unable to decontaminate adequately a contaminated environment.

The Regulations, which are administered by the Division of Occupational Health, apply to the manufacture, use, storage, handling, transportation or disposal of radioactive materials and radiation producing equipment. The primary requisite pertains to registration , which must be made with the State Department of Health to record location, nature, scope of operation and use of radiation sources, and to designate the one person who is responsible for

radiation safety. The regulations also establish requirements for certain records and reporting, and limit the doses of internal and external exposure, both for occupational and general population groups. The regulations do not control or interfere with the diagnostic or therapeutic use of radiation when undertaken or prescribed by a licensed physician, dentist, or other person while practicing the healing arts.

What are some of the existing problems? First, we have our problems in the normal and daily activities which have paralleled the scientific development and advance of our civilization. Radiation problems, like all other health problems, are where the people live and work. One of the major sources of radiation exposure today is the x-ray. Physicians make a major contribution toward reducing the overall radiation exposure problem as they control and reduce all unnecessary exposure to x-ray. They are the sole judges in this, without reducing many benefits in the diagnosis and therapy of diseases. However, x-ray equipment for research, industrial and educational uses are not always under medical supervision.

Second, there is rapid and widespread increase in non-medical uses of isotopes.

Third, we may consider implications arising from Civil Defense and Disaster Transport by ground, water or air can be interrupted accidentally, and expose citizens to isotopes and radium. Problems of tremendous scope could arise from accidental detonation of one of our own fission or fusion weapons anywhere in Texas. All of us recognize the hazard faced from enemy action in releasing radioactive contaminants over wide areas. Non-nuclear military action or the dispersing forces in natural disasters could release large quantities of radioactive material which normally do not present a hazard when under controlled storage. For all of these eventualities each physician in Texas truly is vulnerable. He may be called upon for intelligent practice with no warnings whatever. We must lend our active assistance toward the training of personnel who can accurately detect, identify, and evaluate ever possible radiological health hazard.

We are pleased to report that we have been instrumental in bringing under control indiscriminate use of the shoefitting fluoroscope. We have also had some encouraging cooperation in our efforts to obtain safety improvements in x-ray equipment and in techniques employed. This has involved the installation of cones, filters, shields, more sensitive films, accurate focusing, and shorter exposure times. Recent studies reveal that such changes have permitted production of an equally useful film with a simultaneous reduction in tissue exposure to 1/35th the previous exposure.

We have publicized the diminishing need for use of x-rays without medical supervision or prescription in area-wide mass surveys, formerly more justified when tuberculosis was widely prevalent. While there may be still communities where mass x-ray campaigns are desirable, other groups of people exist among whom the disease is so rare that a more selective use of the x-ray procedure can be adopted with maintained safety to the population.

It is interesting to note that when judicious or curtailed uses of x-ray where not necessary are mentioned, unenlightened people interpret this as implying that we oppose their use under any condition. This is an example of emotionalism that contributes to unwarranted fears, and hampers constructive

attempts to achieve desirable health objectives. We continue to publicize the fact that any individual who would hesitate to accept diagnostic or therapeutic x-rays properly recommended by his own qualified physician would create his own hazard to health without justification.

Now let us examine the actual locations of all of the potentially excessive radiation dosage sources (Figure 12), reported by registration to the Texas State Department of Health. One is struck by the fact that these sources are where the people are, where they work. But some sources can be moved anywhere. A great majority of x-ray equipment registered is under medical supervision, therefore is not subject to regulation except for the occupational aspects pertaining to employees (Figure 13). A significant fact sometimes overlooked is that in the area of legal responsibility, the regulations provide a great deal of protection to physicians. Then, too, study of the registrations of medical x-ray equipment (Figure 14) has brought to light the existence of antiquated, hazardous equipment in certain areas. It has also stimulated many inquiries on recommended procedures and shielding, and thereby has assisted not only registrants but also our staff in educational endeavors. In addition study has indicated areas of possible need for closer administrative attention. For example, in considering the numbers for different counties one wonders after comparing Dallas County with Tarrant or Bexar, whether all equipment in Dallas County has been registered?

Industrial x-ray equipment (Figure 15) sometimes poses greater hazards through the higher operating voltages. We have uncovered some "home made" units where a tube was operated without any shielding. Had the State Board of Health not placed limitations on shoefitting fluoroscopes, undoubtedly our map would show nearly two hundred more registrations.

The Texas regulations apply to all isotopes and include radium, which latter is exempt from Federal regulation (Figure 16). Some of the information on the location of isotopes comes initially from the United States Atomic Energy Commission which supplies us with a monthly list of all persons they license in Texas to obtain byproduct material and special nuclear material. Medical isotope figures include isotopes used for diagnosis and therapy as well as for medical research (Figure 17). Approximately half of all registered isotopes fall into this classification, but non-medical uses are likely to go far beyond medical, and soon! Non-medical isotope figures include those used in industrial processes, for certain appliances such as gauges, for research, and in education (Figure 18). Studies to date indicate that some industrial radiographers lack adequate knowledge on health implications and demonstrate a serious need for further surveillance and education. However, problems could exist in all of the industries and manufacturing operations which we have used for another purpose to place emphasis on non-radiation hazards.

Although only two counties now show reactors (Figure 19), we know of two others planned for educational institutions in the near future. One is to be installed this summer in Houston. Although increasing public awareness and concern over radiation exposure has been directed mainly toward aspects of weapon testing, the rapidly growing number of power reactors poses a far more important potential source of environmental radiation exposure.

What then are some principal problems every physician should consider? Permit us to mention only those experience has made most obvious for the design engineer, the educator, attorneys, insurance companies, industrial

medical services, for health departments, and for the practicing physician. Our information in part has evolved from 14 different incidents involving spills, losses, or illegal disposal or transfer of isotopes which we investigated during the preceding calendar year.

The engineer is faced now with new problems which necessitate competent and complete inspection of construction details pertaining to radiation shielding. Although design details may insure protection, deficiencies or errors in construction can negate design features. An example would be the improper installation of lead sheeting in the walls or ceiling of a room or the use of hollow tile where solid concrete had been specified. Large nuclear projects in the past have utilized the careful, personalized services of highly qualified experts, but will this continue as industry grows? Will such precautions always be taken?

Educators are now faced with radiological health, which constitutes a specialized field with unique concepts, new vocabulary and units of measurement, and super sensitive instruments. An increased number of trained personnel is required to provide planning, surveillance, and instrument development and to serve as radiological officers. We must look to our colleges and universities to provide both teachers and researchers in this new group of specialists.

Attorneys are now analyzing existing statutes and proposing new legislation for application to compensation for workers exposed to excessive radiation, and to determine extent of public liability where nuclear accidents may be involved. Possibilities here become almost astronomical when one considers, the future air, sea, and land commerce related to nuclear shipments or atomic powered carriers. Attorneys have found the regulations to be most essential as a set of standards where damage claims from over exposure have been alleged. For this and other obvious reasons they are supporters of our "gospel" that industry and medicine establish and maintain proper exposure records on their employees and technicians.

Problems for insurance companies are parallel to a large degree with those citied for attorneys. In addition insurers must insist upon knowing what radiation hazards exist for the insured and should demand that their clients establish and observe proper radiological health rules and procedures. They must also increase the investigation of practices and techniques within insured installations, both to establish risk criteria and to guard against unpredicted claims which might be ruinous.

Industrial medical services have already established procedures for a general maintenance of employees' health and to control harmful exposures from other chemical and physical agents. Radiological hazards and the regulations now necessitate increased vigilance where activities are not maintained at maximum safe level. Another problem lies in determining the degree of compliance with company health protection rules by field operators or crews. Assurance must be had that all supervisors and workmen, regardless of location are thoroughly indoctrinated in the potential dangers and the related safe practices required when handling radioactive material or when working in areas where external radiation hazards may exist.

Health departments are increasingly essential because of increasing radiation hazards. Where the community does not have a concentration of hazards which would justify a large variety of specially trained experts, the local

health officer must know of resource personnel he can call in as consultants or to provide necessary instrumentation or analytical services. As the State Health Department has begun to provide specialists as consultants on local problems, in addition to administering the regulations, it must keep informed on state-wide problems or those of intrastate application.

The Health Department must equip itself to cope with future problems. It will not always be feasible for the public to rely entirely on users of radiation for assurance that no environmental or community problems will occur. As nuclear sources of power begin to compete with conventional sources, severe economic pressures may arise to lower operating and capital costs. At such a time the Health Department must be prepared to assure that such proposed economies are not made at the expense of public health consideration.

Then, finally, are the questions for which every physician in practice requires an answer related to his own environment. We have shown why accidents can occur anywhere in Texas. The physician needs to think of this in connection with such activities as the storage of radium, the techniques of threading radium needles, stray radiation from unknown sources; radiation hazards to persons adjacent to improperly shielded physicians' facilities. Some physicians may want advice from their own more highly specializing and qualified medical colleagues. We urge them to obtain it.

We may conclude as we express our conviction that the public must be alerted to the need for and ensured adequate radiological health programs. They might otherwise be expected to let their fears lead to activities which could impede desirable and constructive developments of atomic energy, and the additional benefits which yet will be evolved from atomic medicine. No one here can deny that uncontrolled excessive radiation is harmful, and that exposures to it are cumulative and can cause permanent effects. Therefore, let us so proceed cooperatively that none of us can be accused of mental inertia which might retard needed education, research, public enlightenment or control, to the end that an exorbitantly high price may be extracted from us locally or from future generations.

List of Illustrations

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13	Registrants of All X-Ray Equipment in Texas, March 1, 1958
14	Registrants of Medical X-Ray Equipment in Texas, March 1, 1958
15	Registrants of Non-Medical X-Ray Equipment in Texas, March 1, 1958
16	Registrants of All Isotopes in Texas, March 1, 1958
17	Registrants of Medical Isotopes in Texas, March 1, 1958
18	Registrants of Non-Medical Isotopes in Texas, March 1, 1958
19	Registrants of Reactors in Texas, March 1, 1958

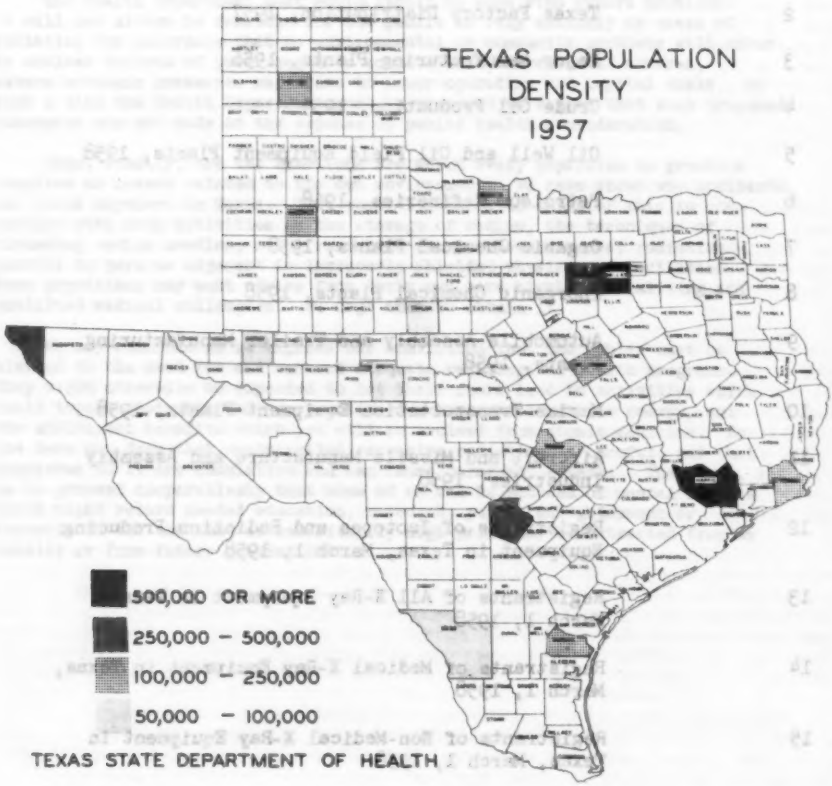
TEXAS POPULATION
DENSITY
1957
500,000 OR MORE
250,000 – 500,000
100,000 – 250,000
50,000 – 100,000
TEXAS STATE DEPARTMENT OF HEALTH

Fig.1

TEXAS FACTORY
DISTRIBUTION
1957
COUNTIES WITH MORE
THAN 130 FACTORIES
207
514
589
1,479
171
244
1,448
778
153
10,821 MANUFACTURERS, HAVING
1 - 20,000 EMPLOYEES, ARE IN
808 OF THE 872 INCORPORATED
CITIES AND TOWNS OF TEXAS.
SOURCE:
SOUTH TEXAN
JAN. 1958
TEXAS STATE DEPARTMENT OF HEALTH

Fig 2

MAJOR MANUFACTURING PLANTS, 1956

EMPLOYING 250 OR MORE PERSONS, 1956

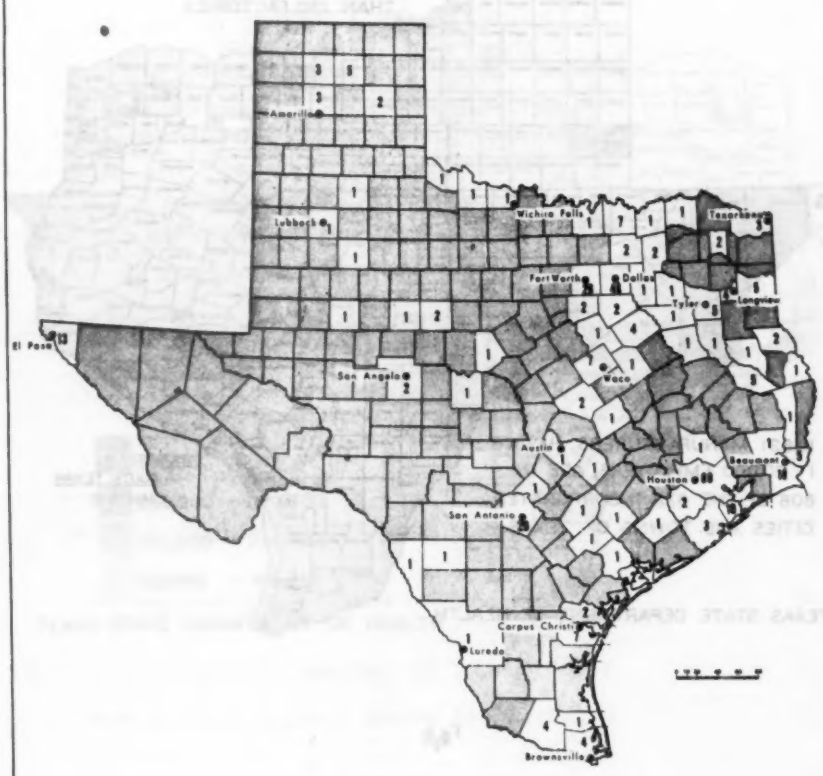

Fig. 3

Source: TEXAS RESOURCES AND INDUSTRIES
Bureau of Bus. Research, Univ. of Tex.

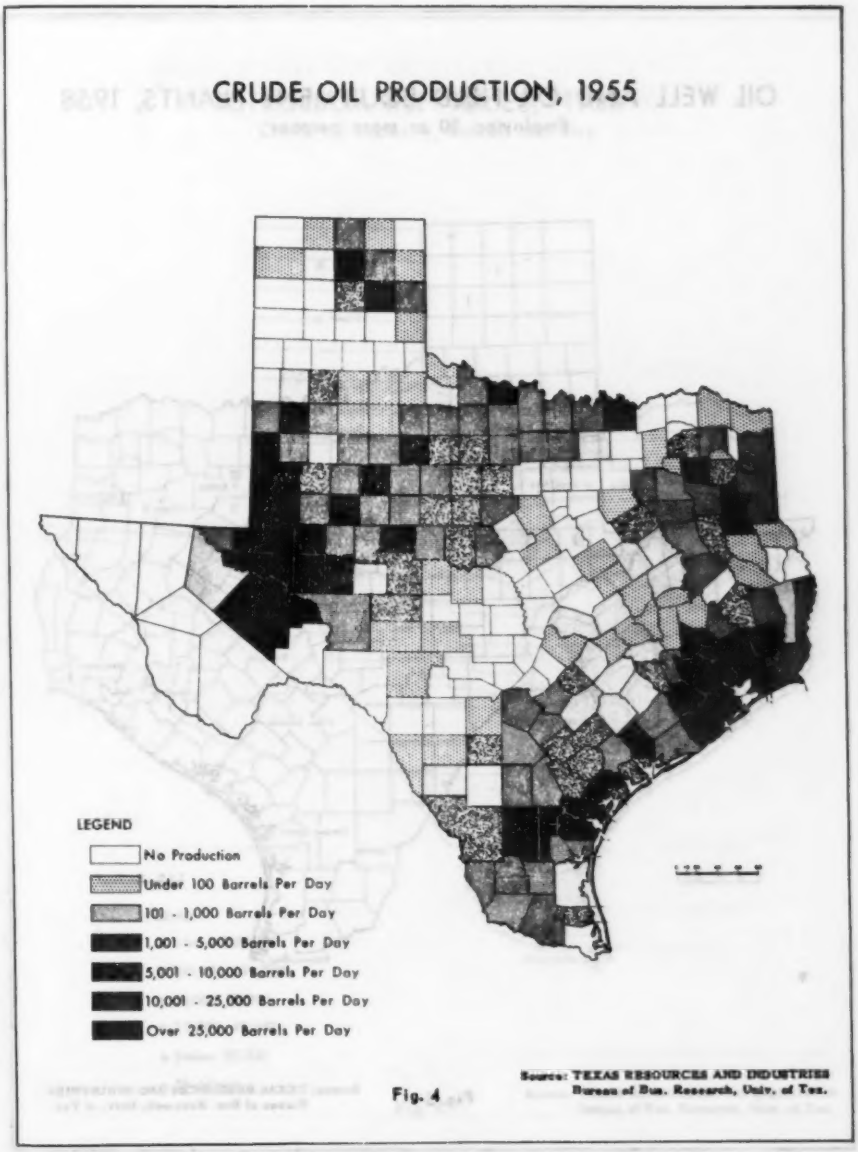
CRUDE OIL PRODUCTION, 1955
LEGEND
No Production
Under 100 Barrels Per Day
101 - 1,000 Barrels Per Day
1,001 - 5,000 Barrels Per Day
5,001 - 10,000 Barrels Per Day
10,001 - 25,000 Barrels Per Day
Over 25,000 Barrels Per Day
Source: TEXAS RESOURCES AND INDUSTRIES
Bureau of Bus. Research, Univ. of Tex.

Fig. 4

OIL WELL AND OIL FIELD EQUIPMENT PLANTS, 1958

Employing 50 or more persons

Fig. 5

Source: TEXAS RESOURCES AND INDUSTRIES
Bureau of Bus. Research, Univ. of Tex.

PETROLEUM REFINERIES, 1958

Crude oil capacity, barrels per day

Fig. 6

Source: TEXAS RESOURCES AND INDUSTRIES
Bureau of Bus. Research, Univ. of Tex.

ORGANIC CHEMICAL PLANTS, 1958

Employing 50 or more persons

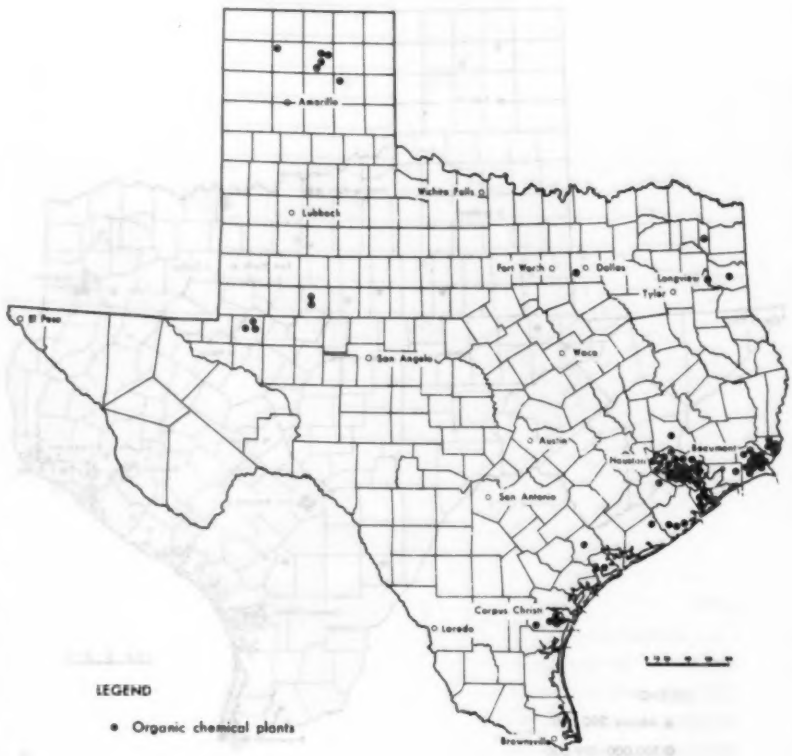

Fig. 7

Source: TEXAS RESOURCES AND INDUSTRIES
Bureau of Bus. Research, Univ. of Tex.

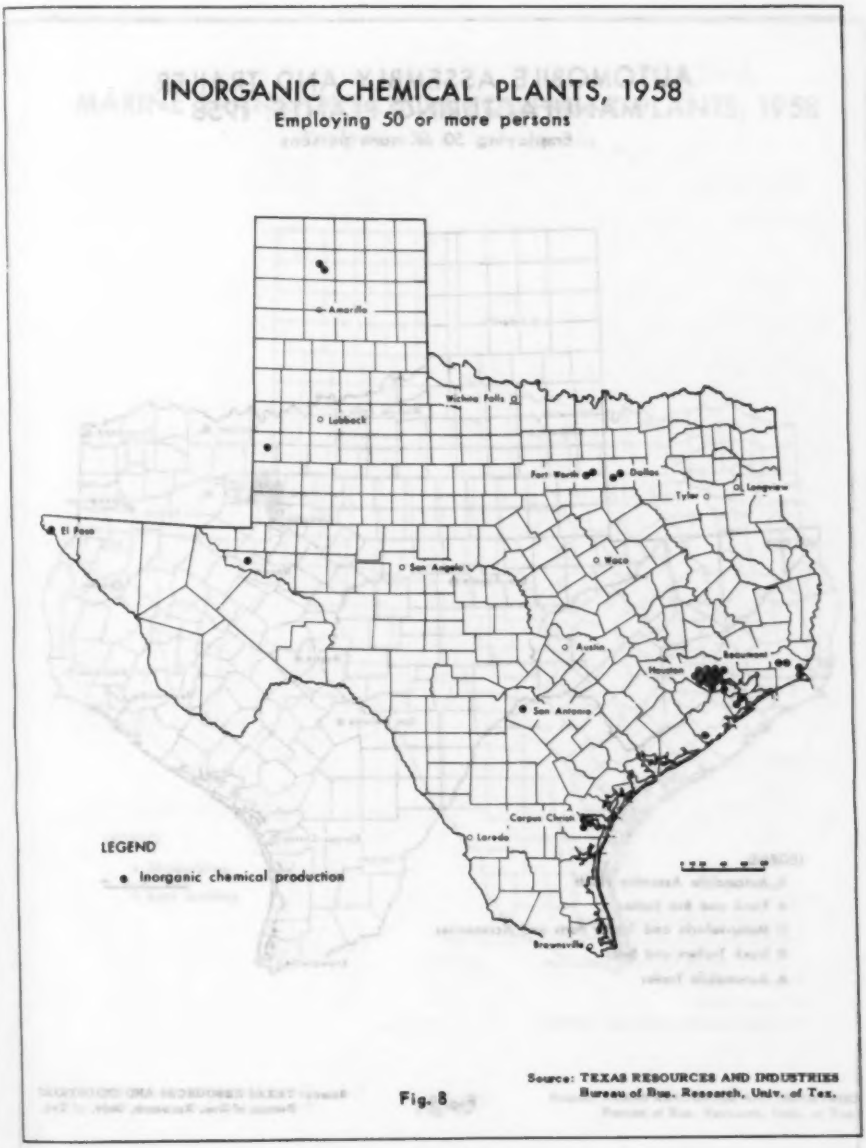

Fig. 8

Source: TEXAS RESOURCES AND INDUSTRIES
Bureau of Bus. Research, Univ. of Tex.

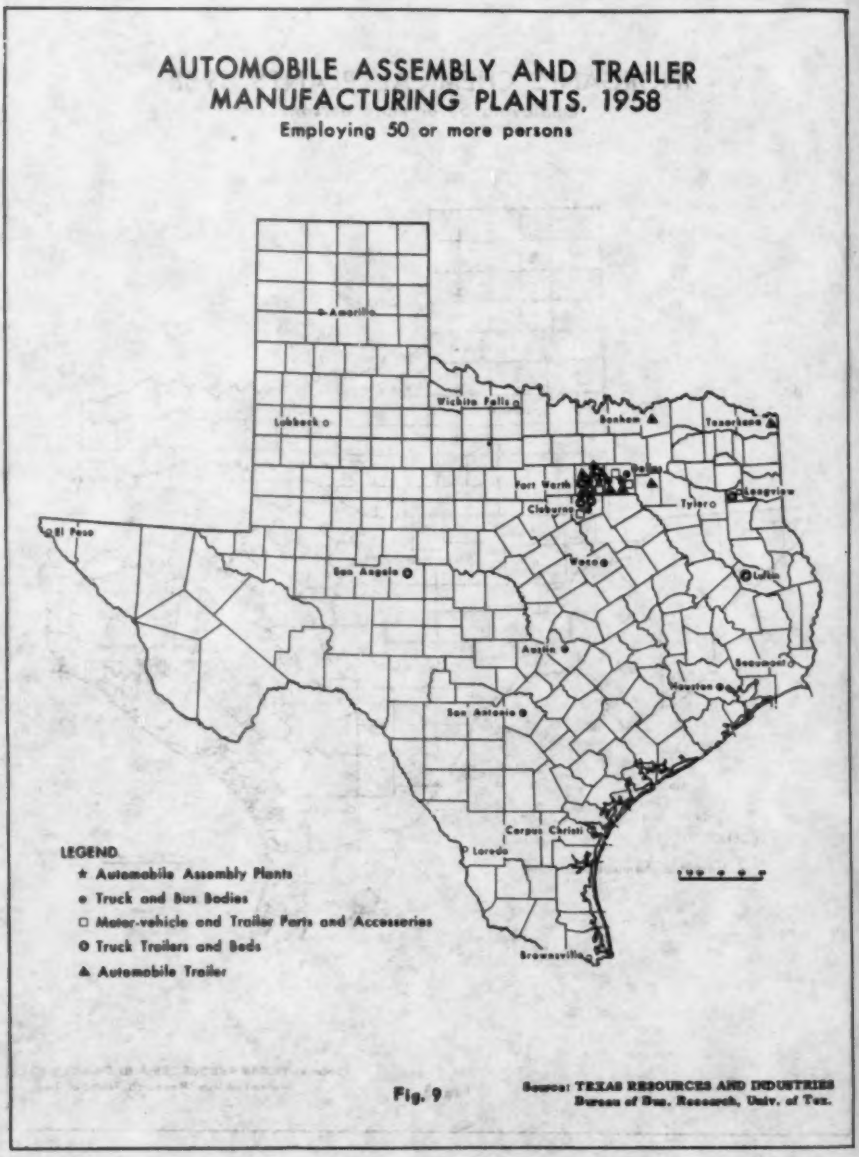

Fig. 9

Source: TEXAS RESOURCES AND INDUSTRIES
Bureau of Bus. Research, Univ. of Tex.

MARINE TRANSPORTATION EQUIPMENT PLANTS, 1958

Employing 50 or more persons

Fig. 10

Source: TEXAS RESOURCES AND INDUSTRIES
Bureau of Bus. Research, Univ. of Tex.

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AIRCRAFT AND MISSILE MANUFACTURE AND ASSEMBLY INDUSTRIES, 1958

Employing 50 or more persons

Fig. 11

Source: TEXAS RESOURCES AND INDUSTRIES
Bureau of Bus. Research, Univ. of Tex.

REGISTRANTS OF
ISOTOPES AND RADIATION
PRODUCING EQUIPMENT
IN TEXAS
-NONE
1 MARCH, 1958
TEXAS STATE DEPARTMENT OF HEALTH

Fig 12

REGISTRANTS OF
ALL X-RAY EQUIPMENT
IN TEXAS
-NONE
1 MARCH, 1958
TEXAS STATE DEPARTMENT OF HEALTH

Fig 13

REGISTRANTS OF
MEDICAL* X-RAY
EQUIPMENT
IN TEXAS
* M.D., D.O., D.D.S., CLINICS, HOSPITALS
-NONE
1 MARCH, 1958
TEXAS STATE DEPARTMENT OF HEALTH

Fig 14

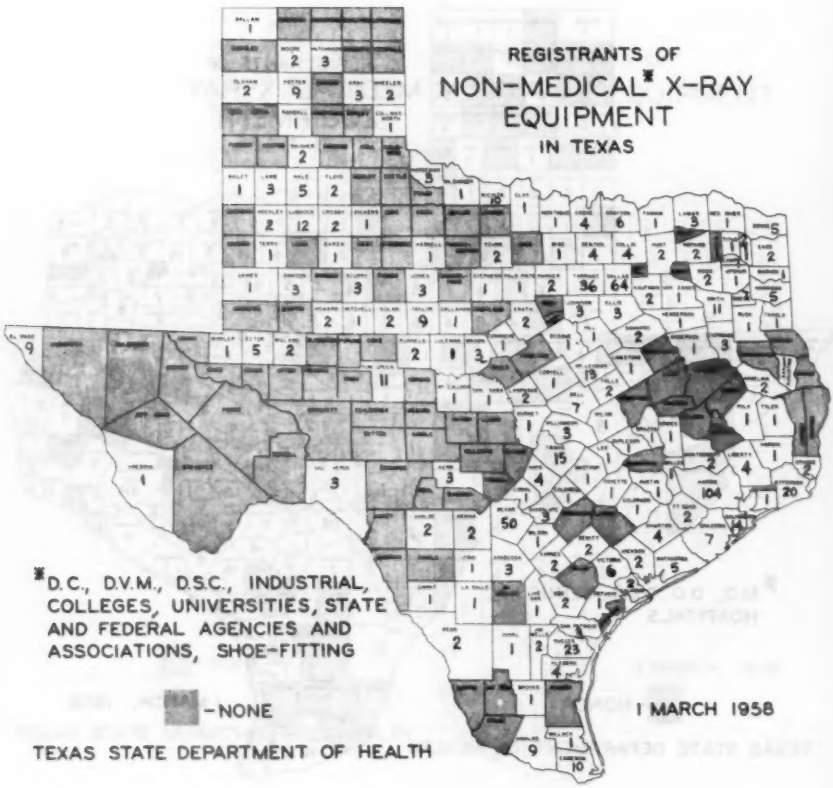
REGISTRANTS OF
NON-MEDICAL* X-RAY
EQUIPMENT
IN TEXAS
*D.C., D.V.M., D.S.C., INDUSTRIAL, COLLEGES, UNIVERSITIES, STATE AND FEDERAL AGENCIES AND ASSOCIATIONS, SHOE-FITTING
-NONE
TEXAS STATE DEPARTMENT OF HEALTH
1 MARCH 1958

Fig 15

REGISTRANTS OF
ALL ISOTOPES
IN TEXAS
- NONE
1 MARCH 1958
TEXAS STATE DEPARTMENT OF HEALTH

Fig 16

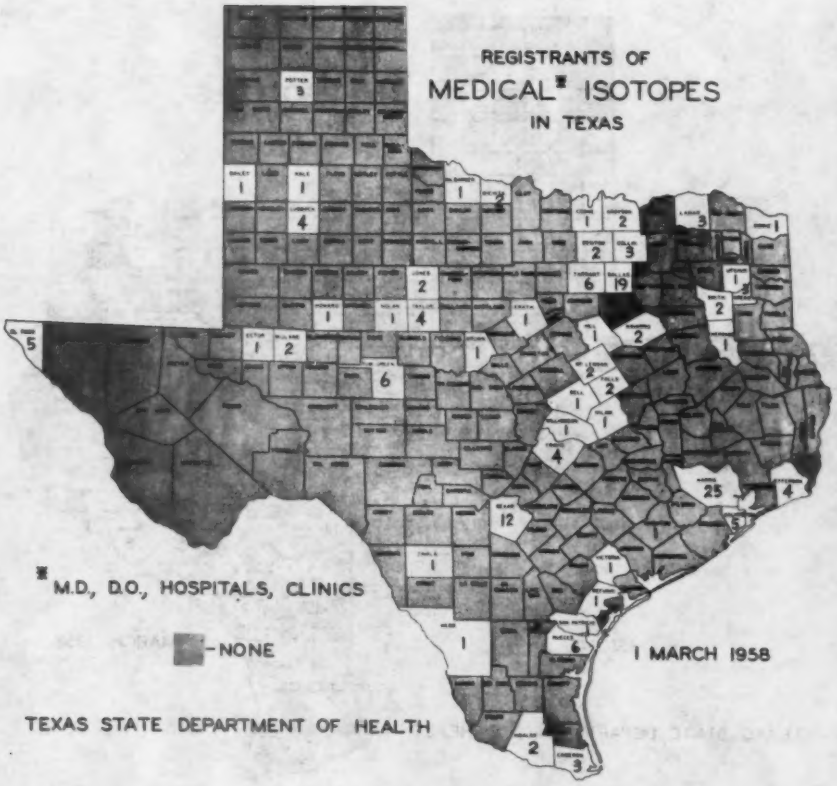
REGISTRANTS OF
MEDICAL* ISOTOPES
IN TEXAS
* M.D., D.O., HOSPITALS, CLINICS
-NONE
1 MARCH 1958
TEXAS STATE DEPARTMENT OF HEALTH

Fig 17

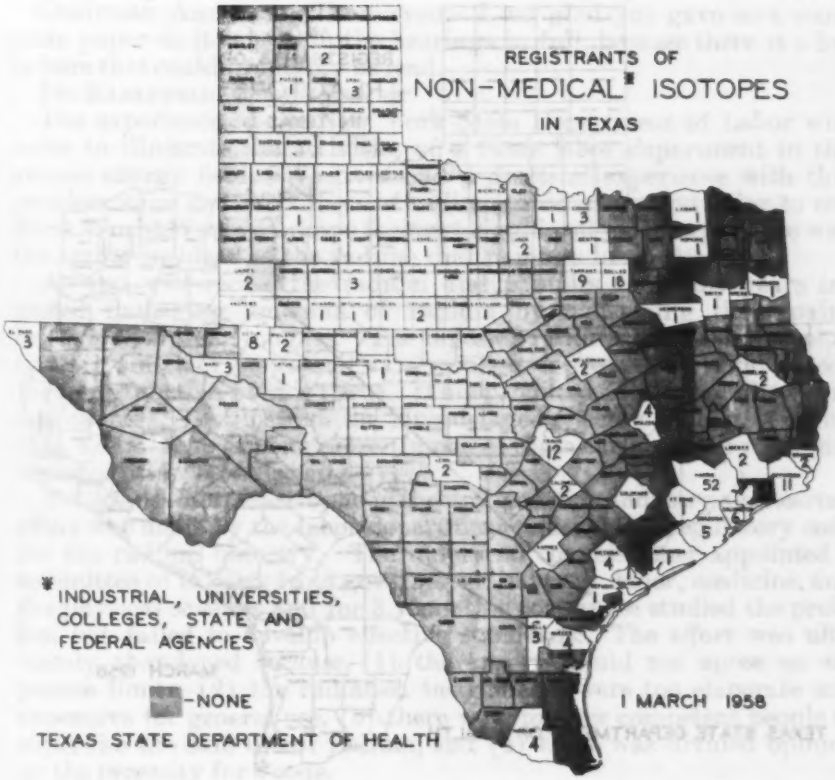
REGISTRANTS OF
NON-MEDICAL* ISOTOPES
IN TEXAS
*INDUSTRIAL, UNIVERSITIES, COLLEGES, STATE AND FEDERAL AGENCIES
-NONE
1 MARCH 1958
TEXAS STATE DEPARTMENT OF HEALTH

Fig 18

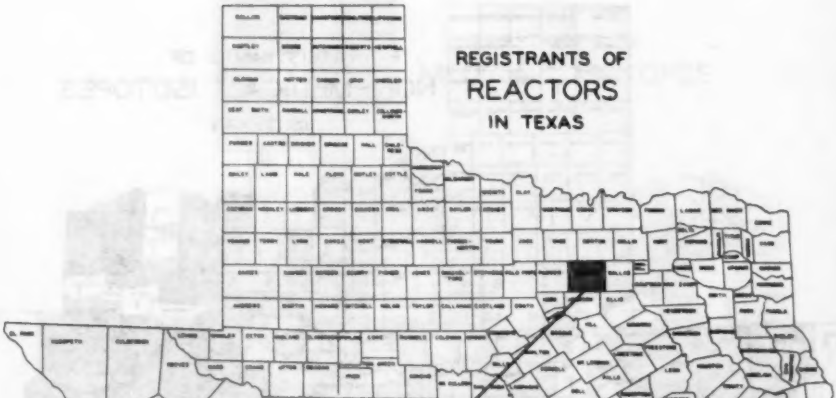
REGISTRANTS OF
REACTORS
IN TEXAS
2
1
MARCH 1958
TEXAS STATE DEPARTMENT OF HEALTH

Fig. 19

Chairman ANDERSON. We will turn now to Dr. Kleinfeld and the activities of the State labor department.

Dr. KLEINFELD. Mr. Chairman, I am director of the Division of Industrial Hygiene of the New York State Department of Labor.

I will skip from time to time, Mr. Chairman, and point out the areas.

Chairman ANDERSON. Thank you. I am glad you gave us a complete paper so it can go in the hearings in full, because there is a lot in here that could profitably be read.

Dr. KLEINFELD. Thank you, sir.

The experience of the New York State Department of Labor will serve to illustrate the activities of a State labor department in the atomic energy field. We have had a practical experience with this problem since the early days of radiographic inspection prior to the First World War. Perhaps the most significant early experience was the tragic incident of the radium dial painters in the 1920's.

As you will recall, the radium dial painters for many years ingested damaging amounts of radium by moistening their paint brushes with their tongues. The ingested radium was deposited particularly in their bones and as a result it depressed the vital blood-forming function of this tissue. This produced fatal blood disorders and cancer. To illustrate the long-delayed effects of ionizing radiation, a fatal case of bone cancer in one of those early workers was just reported a few months ago.

Following this catastrophe in the dial-painting industry a concerted effort was made by the labor department to develop a regulatory code for the radium industry. The industrial commissioner appointed a committee of experts from government, industry, labor, medicine, and the physical sciences and for 3 years this committee studied the problem but failed to develop effective standards. The effort was ultimately abandoned because (1) the experts could not agree on exposure limits, (2) the radiation instruments were too elaborate and expensive for general use, (3) there were too few competent people to supervise the safe use of radium, and (4) there was divided opinion on the necessity for a code.

In the ensuing years, as industry increased its use of ionizing radiations, the division of industrial hygiene of the labor department gained further experience in the practical problems of control. By refining their basic techniques, industrial hygiene engineers were able to minimize the hazards. They learned to segregate and shield radiation sources, to ventilate radioactive dusts and gases, to dispose of radioactive wastes, and to develop more reliable instruments.

World War II gave the greatest impetus to both the industrial application of atomic energy and to the techniques of control. During the war the Manhattan district project was initiated. By that time enough knowledge was available to recognize the inherent hazards of radiation and the importance of safety to the success of the project. Money was therefore poured unstintingly into this high priority

project, and concurrently an effective safety program was developed. Out of these efforts there emerged a new group of safety experts, the health physicists. These scientists did much to improve the control technology and it is a great tribute to them that they achieved such a remarkable safety record.

Since World War II there has been an enormous growth in the industrial application of nuclear energy. For some time now, New York State had been one of the Nation's largest industrial users of ionizing radiations, and we wanted to maintain safety in the industry in order to promote its growth. Up to wartime period, the regulatory mechanisms of the past were adequate for safety.

The Atomic Energy Commission, which succeeded the Manhattan project, supervised contract industries that used certain particle accelerators, nuclear reactors, and artificial radioisotopes by means of its licensing procedure.

Applicants for contracts were inspected by the Atomic Energy Commission, and if their safety programs met the stringent specifications, they were granted permits.

The State labor department was responsible for the protection in the use of natural radioactive materials such as radium and its daughter products, industrial X-rays, and fluoroscopes, and various other equipment.

However, by 1953, it was perfectly clear that the industrial expansion would soon outstrip the department's capacities for supervision and all authorities agreed that a code was obviously needed for the following reasons:

1. With the increasing use of ionizing radiations, the identification of users, essential to effective control, was becoming more difficult.
2. There was a need for an administrative mechanism for control of the hazards.
3. There was a need to clarify jurisdictional responsibilities for maintaining control.
4. There was a need to define management's responsibilities in radiological protection.
5. There was a need to define standards and techniques of safe performance.

NEW YORK STATE'S EXPERIENCE IN ADMINISTERING A RADIATION PROTECTION CODE

A comprehensive industrial code rule was promulgated in December 1955 to achieve the aims in radiation protection already mentioned.

The clear definition, in the New York State sanitary and industrial codes, of the respective responsibilities of the health and labor departments in matters of radiation protection has effectively averted an overlap in the functions of the two departments. The labor department has been assigned jurisdiction over industrial sources and

uses of ionizing radiation and the health department has been given responsibility for nonindustrial applications. In general, the labor department assumes responsibility for everything which takes place inside the walls of an industry; and the health department has responsibility for everything outside.

The code has proven to be an extremely useful educational tool. It has impressed upon industry the dangers inherent in the use of ionizing radiation and has encouraged equipment manufacturers to design their devices with adequate safeguards.

Five full-time and two part-time professional employees of the State labor department's division of industrial hygiene administer the industrial code rule relating to radiation protection. Since the promulgation of the code rule in 1955, the State legislature has appropriated an approximate annual average of $47,000 to the labor department for the personnel and equipment required to administer the code rule.

REGISTRATION OF SOURCES IN INDUSTRY

Most of the sources have been registered since the inception of the code. To date, there are approximately 425 registered installations with nearly 6,000 pieces of equipment and 50,000 curies of radioactive material. This does not include material classified because of security restrictions.

Tables I and II are detailed tabulations of this data.

Although approximately 5,000 people are exposed to some ionizing radiation in the course of their employment in the registered installations in New York State, most of their exposures are minimal. From data recently compiled by the New York State Labor Department, over 95 percent of the occupational radiation exposures are less than 50 mrem per week, which is considerably lower than the maximum permissible dose of 100 mrem per week as prescribed by the AEC for its contractors. Available data indicate that the experience of the AEC contractors is similar.

Mr. TOLL. Dr. Kleinfeld, does this indicate that you require installations to be registered rather than every radiation source?

Dr. KLEINFELD. That is right. We do not register sources. We register installations.

Mr. TOLL. How is an installation defined?

Dr. KLEINFELD. It is defined by the management, per se. They define what they consider their installation. They may have as many sources in that installation as they deem practical. We register the installation. We do not register sources.

Mr. TOLL. I am sorry, I did not hear you. It is defined by whom?

Dr. KLEINFELD. Management, per se. They tell us what they consider an installation and they register that installation.

Mr. TOLL. It is left up to the user to decide?

Dr. KLEINFELD. Yes, sir, the responsibility rests with management.

Mr. TOLL. Ordinarily, for an X-ray machine, management would be justified in concluding this was not an installation and they would not register it?

Dr. KLEINFELD. If this was the only source in the installation this would be registered as an installation and the source would be mentioned in terms of the kilowatts, and so on.

Mr. TOLL. Then every X-ray source is registered. It is just a question of how many will be grouped under one installation.

Dr. KLEINFELD. That is right.

The radiation hazard is still relatively low compared with other industrial hazards, such as silica dust and chemical air contaminants. However, over the past 18 months, the number of registered installations has increased by one-third and the number of exposed employees has increased by nearly one-half. In terms of strength and the number of sources and the widening use of ionizing radiation, the potential radiation hazard is of sufficient magnitude to justify continuous efforts toward its control.

DEGREE OF COMPLIANCE

During the first 18 months the code was in effect, control measures were evaluated in about half of the installations, excluding those of AEC contractors. In 6 percent of these, the excessive exposures which were found were subsequently reduced. In only one case was legal action required to secure compliance. Compliance with other requirements such as proper surveying, posting of warning signs, personnel monitoring, and maintenance of records, was less complete initially. Through such means as on-the-spot education, sponsored seminars, publications, and persuasion, increased compliance has been obtained and we anticipate that this trend will continue.

As of March 1, 1959, over 90 percent of the registered installations have been inspected and evaluated. Table III is a summary of administrative activities and it shows that there is current compliance under normal operating conditions with maximum permissible dosages and maximum allowable concentrations. In three plants, it was necessary to prescribe additional protective measures to ensure that the dose limits of personnel working outside the radiation area, that is, one-tenth of the prescribed dosage, would not be exceeded.

In their order of frequency, the types of noncompliance encountered include failures to—

(1) Perform an adequate survey;
(2) Monitor exposed personnel;
(3) Maintain radiation records;
(4) Register radiation sources;
(5) Report accidental overexposures; and
(6) Post radiation areas.

OVEREXPOSURE DATA

Excessive exposure to radiation is defined in the New York State Industrial Code rule No. 38 as a dose in excess of 3 rems during a 13-week period. Nineteen such incidents have been reported to the New York State Labor Department since the promulgation of the code a little over 3 years ago.

Eight of these incidents did not actually constitute overexposures of individuals. In seven, the reports were based upon an erroneous measurement of exposure, caused by improper handling of radiation measuring devices. For example, in several of these situations, excessive readings on film badges resulted from their storage in high radiation areas. In the other incident, prompt evacuation of personnel from the work area following an accidental spillage of strontium 90 prevented overexposure.

Chairman ANDERSON. What were they doing with the strontium 90?

Dr. KLEINFELD. They were using it—I am not sure whether it was with a hearing aid or in another capacity. I don't recall at the moment which application this was for.

Chairman ANDERSON. I don't intend to harass you. I know there are numerous industrial applications for it.

Dr. KLEINFELD. I could find out.

These conclusions are supported by the fact that there was no discernible clinical evidence of injury in any of the eight incidents.

The 11 instances of actual overexposure may be divided into two categories:

(*a*) Those due to chronic low-level routine overexposures ranging from 0.4 to 1.2 rems per week exceeding the 3 rems per 13 weeks of penetrating radiations from radioactive material; and

(*b*) Those created by acute high-level accidental overexposure to X-rays and radioactive materials with dosages ranging from 30 to 1,200 rems.

The exposures in the latter group were fortunately confined to noncritical areas of the body.

Of the 11 instances of actual overexposure, 3 cases of observable injury; that is, radiation burns, were clearly established as having originated after the code went into effect. In the plants where overexposures were reported, remedial measures have since been taken to avoid recurrence.

CONTEMPLATED REVISIONS OF INDUSTRIAL CODE RULE 38

In the light of recent changes in the standards set forth by the National Committee on Radiation Protection (NCRP) and from our experience gained in administering New York State Industrial Code rule No. 38, the industrial commissioner's advisory committee on the radiation code has met periodically to consider the following revisions:

1. Incorporation of the new dosage limits set forth by the NCRP;
2. Omission of the requirement for labeling of small sources which are exempt from registration;
3. Changing the registration requirements of a high voltage thermionic equipment based on the intensity of their radiation output rather than on their operating voltage;
4. Making requirements for storage of radioactive wastes within the plant consistent with the waste disposal rules set up by the State health department; and

5. Making requirements for storage of radioactive wastes of certain strengths in fireproof quarters consistent with good fire-prevention practices.

These revisions are intended to—

1. Permit better coordination with other State agencies involved in the field, such as health and fire departments;

2. Eliminate unnecessary restrictions for industry, thereby encouraging it in the utilization of atomic sources; and

3. Assure more adequate radiation protection without imposing any real hardship upon industry in meeting the downward revision of standards. As has already been mentioned, approximately 95 percent of industry is already meeting these newer proposed standards.

THE NEED FOR RESOLUTION OF CONFLICTING OPINIONS

As our experience in the field of radiation protection have accumulated certain differences of opinion have arisen which require clarification to ensure a more uniform approach:

1. Variation in standards and codes

Some observers have highlighted differences among the various codes as a weakness in State regulation. Such differences include the variations in the phraseology of permissible dose limits, and the details of recordkeeping and exemption requirements. Although these differences do exist, they do not significantly reduce the radiation protection provided to the worker. Other variations are due to differences in delegated responsibilities.

2. Identification of the major industrial radiation hazard

Although not fully appreciated in our experience, the major hazard in industry is at present associated with the use of radiation producing equipment rather than radioactive materials. X-radiation continues to constitute the bulk of the problem in terms of numbers of installations and degree of hazard. Equipment which produces X-radiation does not come within the AEC licensing regulations. By comparison, AEC licensed sources are relatively few, and for the most part constitute low level hazards.

3. Extent to which special training is required

There has been undue emphasis upon the need for highly specialized skills and personnel for coping with radiation hazards in industry. Experience has shown that currently employed safety supervisors, engineers, and industrial physicians with some additional specialized training in radiation protection can handle most radiation problems. This is borne out by a study by a large corporation which performs highly diversified and widely scattered operations involving the use of ionizing radiation.

The same postulate applies to governmental occupational health personnel who enforce codes. However, in certain areas, such as special nuclear production and utilization facilities, there is a need for personnel with special qualifications.

PROBLEM AREAS IN STATE LABOR DEPARTMENT ACTIVITIES

There are a number of problem areas which exist on the State enforcement level. On the whole the problems differ, depending upon the administrative framework, the degree of industrialization, and the extent of the progress in the State. The following illustrate some of these areas:

1. Budgetary considerations

The budgetary needs vary with the scope and type of program necessary to provide adequate safeguards. A comprehensive program to control the increased hazards created by the expansion of the atomic industry will require increased budgetary supplementation. Data obtained by the U.S. Public Health Service on the radiation program in 12 States indicate that in general, the present budgetary allowances should be increased. Continuing financial support is needed to recruit additional personnel and to provide additional training for those already engaged in radiation protection in order to keep pace with the expansion of the industrial utilization of atomic energy. Many States are looking to the Federal Government for financial assistance for these purposes.

2. Nuclear energy development and radiation protection

The extent of the development and acceleration of the nuclear energy industry in the State is closely tied to the regulatory requirements. Regulations which are too stringent and excessive inhibit and discourage nuclear development. Conversely, inadequate regulations which fail to prevent injury or serious incidents may, by arousing public opinion, be as serious a deterrent to the expansion of nuclear energy programs as inflexible rules.

Adequate data based on experience, proper dissemination of information at all levels, and a continuing effort to resolve differences when and where they arise is essential to meet this dual need for safety and progress in atomic development. The contemplated revisions of the industrial radiation code of New York State are in keeping with these two objectives.

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3. Interstate problems

The use and transportation of portable radioactive sources outside the State in which they are registered present problems in administrative control. In New York this is a problem in which the State labor department has a vested interest. This can be met by the formulation of interstate compacts and adoption, by the several States, of consistent regulations for radiation protection. An interstate agency may be of value in resolving issues of common interest to the States.

SUMMARY AND CONCLUSIONS

From the experience of the New York State Labor Department, a comprehensive code has proven to be the most effective instrument for the control of industrial radiation hazards. This is based on a 3-year administration of this code.

The current major industrial radiation hazards arise from radiation producing equipment rather than from radioactive sources. The former is under the exclusive jurisdiction of the States while the responsibility for the latter is shared by both the Federal and State Governments.

Certain problem areas have been highlighted, such as the interrelationship between regulation and nuclear energy development. There is a need for practical radiation protection requirements to strive toward the dual objective of safety and progress in this field.

(References and tables accompanying Dr. Kleinfeld's statement follow:)

REFERENCES

1. Martland, H. S.: "Occupational Poisoning in Manufacture of Luminous Watch Dials; General Review of Hazard Caused by Ingestion of Luminous Paint, With Especial Reference to New Jersey Cases." J.A.M.A. 92: 466, 552, 1929.

2. Joint Committee on Atomic Energy, Congress of the United States: "Selected Materials on Employee Radiation Hazards in Industry," U.S. Government Printing Office, Washington, 1959.

3. Frampton, George T.: "Radiation Exposure—The Need for a National Policy," Stanford Law Review, volume 10, No. 1, December 1957 (reprint).

4. McAdams, W. A.: "Radiation Protection in the Industrial Use of Radiation," appearing in "Selected Materials on Employee Radiation Hazards in Industry," by the Joint Committee on Atomic Energy, Congress of the United States, U.S. Government Printing Office, Washington, 1959, pages 173–179.

5. Personal communication to the author from Richard Marx, assistant regional engineer, U.S. Public Health Service, region II, 1959.

TABLE I.—*Distribution of registered installations by industry as of Mar. 1, 1959*

Industries	*Number of installations*
Total	425
Mining	1
Manufacturing:	
Stone, clay, and glass	5
Primary metals	19
Fabricated metals	44
Machinery, nonelectrical	19
Machinery, electrical	40
Transportation equipment	25
Instruments	35
Food and kindred products	5
Textiles	9
Apparel	13
Paper and allied products	22
Printing and publishing	20
Clinical and allied products	40
Petroleum and coal products	7
Rubber products	4
Miscellaneous	29
Public utilities	12
Transportation	7
Wholesale and retail trade	4
Service industries	30
Research and development	31
Not elsewhere classified	4

TABLE II.—*Number of registered sources, by type and strength, as of Mar. 1, 1959*

Type	Number of sources	Quantity in curies	Percent change from July 1, 1957
Radiation producing equipment:			
Industrial X-rays [1]	437		+23
Radioactive static eliminators [1]	4,428		+175
Medical X-rays [1]	158		+28
Gaging devices [1]	284		+29
High voltage thermionic equipment [1]	900		+26
Particle accelerator [1]	10		−33
Neutron sources [1]	45		+400
Nuclear reactors	8		+14
Radioactive materials: [2]			
Small sealed sources [3]		63,276	+380
Large sealed sources [4]		39,123,900	+15
Unsealed isotopes		7,242,422	+20
Radium and daughter products [1]		7,967	+151
Unsealed uranium and thorium		10,209	+77
Irradiated activated materials		0.015	−76

[1] Items wholly or partially exempt from AEC jurisdiction.
[2] Source strength does not include classified quantities of fissionable material.
[3] Source strength less than 1 curie.
[4] Source strength 1 curie or more.

TABLE III.—*Summary of administrative activities as of Mar. 1, 1959*

Type of source	Registered installations		Inspected installations		Noncompliance								
	Number	Estimated number of workers	Number	Number of workers	Dose limits	Surveys	Monitoring	Records	Appointed RSO [1]	Instructions to employees	Storage and securing of sources	Units from radiation area	Miscellaneous [2]
Total	(3)	5,048	(3)	4,257									
Industrial X-ray unit	171	1,537	147	1,321	1	22	21	13	2	1	1	7	64
Medical X-ray unit	87	224	79	203		15	6	8		1			28
Radioactive static eliminator	91	1,247	71	973	1	19	29	1	1	2	8		38
Small sealed sources	77	371	65	313		10	4	4	1	3		2	18
Radiation gaging devices	97	501	86	444		8	8	8		2	3		33
High-voltage thermionic equipment	44	374	35	297		5	2	3					16
Unsealed isotopes	38	290	37	282		10	2	3		1			9
Radium and daughter products	17	127	17	127	1	8	5			2			3
Unsealed uranium and thorium	34	126	26	96		4		2					4
Irradiated active materials	2	12	2	12				1					1
Large sealed sources	38	126	29	96		4	2	3			1		7
Other sources	23	113	69	93		3	4						4

[1] RSO: Radiation safety officer.

[2] Includes such matters as registration, reporting, labeling, posting, warning signals, leakage tests, instruments.

[3] Total is nonadditive since installations may have more than 1 source.

Chairman ANDERSON. Thank you very much, Doctor.

Mr. Ramey has a question.

Mr. RAMEY. What are the relations between your department and the health department or the group that regulates nonindustrial users? Do you have a working relationship?

Dr. KLEINFELD. We have a very close relationship with them. We have almost simultaneous codes. They are rather close. The sanitary code of the State health department and the code rule of the State labor department, are closely written and identified in terms of proper standards and dose limits.

We have taken the definition which is clearcut, that anything that occurs within the industrial framework is under the jurisdiction of the labor department. Anything outside the industrial framework belongs to the State department of health. That is within their purview.

Mr. RAMEY. Would that include medical and dental X-ray equipment, for example? Would it be under the State health department?

Dr. KLEINFELD. It would be under the State health department if they are outside an industrial establishment. Within the industrial establishment we have assumed the responsibility for radiation protection.

Mr. RAMEY. What are your relations with your new atomic coordinator?

Dr. KLEINFELD. Our relationship with him is rather a close one. His responsibilities will be:

(1) To coordinate the functions of the various departments that have a vested interest in the field of radiation protection;

(2) He has a common interest of promoting the atomic development within the State in which the various departments have a similar interest and desire.

He is concerned with radiation protection. In this regard he closely identifies himself with our efforts.

I believe that the atomic development office will meet periodically through an intragovernmental council to review the administrative procedures that are occurring within the various State agencies and also perhaps act to resolve gray areas should they arise in terms of jurisdiction. To date we have had none. At the same time foster and facilitate our efforts to procure personnel, obtain financial support, and so on.

Mr. RAMEY. Did your department handle the prosecution of the outfit that was burying waste in its backyard? There was a great deal of publicity about it a year or two ago.

Dr. KLEINFELD. I am not sure whether you have reference to a company located in Westchester.

Mr. RAMEY. Yes.

Dr. KLEINFELD. This was a joint effort of the labor and health departments, since the areas of noncompliance affected both departments. Compliance within compliance, noncompliance with the dose limits was a problem of the State labor department, and we were concerned with that. The waste disposal was a problem of the State health department, and they joined their efforts with us in seeking compliance.

This was the only company in New York State in our 3 years, in 20 years of efforts in this field, where we have had to take legal steps to assure compliance.

Chairman ANDERSON. Would that be the Canadian Uranium case?

Dr. KLEINFELD. Yes, sir.

Mr. RAMEY. What is the status of that case now?

Dr. KLEINFELD. At the present time and for the past year they have been in compliance with our requirements.

Chairman ANDERSON. Thank you very much.

Mr. Toll, our counsel, has a question.

Mr. TOLL. Dr. Kleinfeld, you have indicated that you try to keep your standards consistent with Federal standards and that you have a number of inspectors to get around to these various radiation activities. Would you say that there are a number of States that are not as diligent as New York State in inspecting and enforcing these regulations?

Dr. KLEINFELD. I would hate to speak for other States.

Mr. TOLL. Let us put it this way: Could you say how many other States are as good as New York State?

Dr. KLEINFELD. We just had the State of Texas before me.

Chairman ANDERSON. Beyond that?

Dr. KLEINFELD. I would say we were in this area quite early forced upon us by a number of activities. Because of this we have had to participate quite actively in it.

Mr. TOLL. Would you say that before the Commission turns over certain areas for which it now has responsibility, such as radioisotopes, that it should make sure that the State has people and the desire to inspect and enforce regulations to protect workers and the public?

Dr. KLEINFELD. I am sure it would be consistent with the State's wishes. I would have some doubts that any State would desire and seek to inspect and license and register sources for which they have no trained staff to do the job. I doubt if a State would put itself on a limb to assume responsibilities in this field where they have no professional personnel to provide administrative control.

Chairman ANDERSON. Thank you very much.

Mr. Jacoe will be the next witness. I can only say that I am very happy to see somebody from the Colorado Plateau on the panel. Welcome.

Mr. JACOE. Thank you, Mr. Chairman.

The Colorado State Department of Public Health welcomes this opportunity to present its role in matters relating to radiation and health, particularly concerning problems associated with the mining and processing of uranium ores.

In the middle forties many new bodies of uranium ore were discovered on the Colorado Plateau, comprising portions of Colorado, New Mexico, Arizona, and Utah. In 1949 when both uranium mining and uranium processing had reached sizable proportions in Colorado, the State health department sponsored a meeting of government officials and representatives of miners and processors of uranium to consider the potential hazards of this industry.

This concern was based on meager reports from Europe originating from the Schneeberg and Joachimstahl Mines where it had been noted for many years that there had been a high mortality among the

miners from pulmonary diseases. After several hundred years in the late 1800's the affliction was identified as a malignant tumor of the lung, causing 50 to 70 percent of all the deaths of the workers. Although the cause has been controversial and there is a lack of information from this area, the predominant opinion now is that the radioactive materials present in the mine air were responsible. It is possible that other environmental conditions may be implicated, therefore, it is not possible to compare the situation in American mines to that of these European mines. Environmental studies in the American mines have revealed concentrations of radioactive materials considerably in excess of those reported from the European mines.

URANIUM STUDIES AND CONTROL PROGRAMS

As a result, the State health department, bureau of mines, and industrial commission, and the principal uranium companies and associates requested the Public Health Service to conduct a health study of the industry. The Service complied by making a grant to the State health department and developing a joint program of studies supervised by the Service. The program started in 1950 and has been continued to date; with the cooperation of additional Federal agencies, such as the Bureau of Mines and the Atomic Energy Commission, and the continued assistance of the State agencies mentioned.

Physical examinations of the miners and environmental studies in the mines and mills of the Colorado Plateau area, 1950–55, demonstrated the nature of the radon and radon daughters problem, the maximum acceptable concentrations of the alpha emitting radon daughters, and the feasibility and importance of mechanical ventilation of the working areas for controlling internal exposure to radioactive materials. Further grants by the Public Health Service to the State health department financed continuing studies to test the tolerance level and to develop new techniques of evaluating exposures. Supplementary studies of radon and radon daughters in nonuranium mines, of urinary polonium excretion of uranium miners, and of lung cancer among these miners also have been supported by Public Health Service personnel and grants.

The findings in the radon studies were discussed at a seven-State regional conference—including Arizona, Colorado, Idaho, New Mexico, South Dakota, Utah, and Wyoming—held in Salt Lake City, in 1955. As a consequence, a standard of 300 micromicrocuries of total radon daughters—Ra A, Ra B, Ra C—per liter of air was adopted as the safe working level by the health authorities of the States, the Atomic Energy Commission, and the Colorado Bureau of Mines.

As you know, the Atomic Energy Commission's regulatory powers regarding radiation hazards apply to the uranium mills and processing plants but not to the mines. The health and safety responsibilities of the Colorado State Health Department, Bureau of Mines, and Industrial Commission, however, pertain both to the mines and to the mills and processing plants and apply not only to radiation but to other types of hazards.

There are now about 400 uranium mines operating in Colorado. More frequent evaluations of the working conditions are needed and more personnel trained in radiation inspecting are needed to do the

job. These problems were discussed at a meeting in June 1958 to which the State health department invited representatives of numerous national and regional branches of the U.S. Public Health Service, Atomic Energy Commission, and Bureau of Mines, and also the State bureau of mines, industrial commission, and compensation insurance fund.

The program necessary to evaluate and control the problem within the mines has become apparent from the small amount of environmental evaluations that have been made. Before control measures can be recommended to mine operators it is necessary to first evaluate working conditions within the mines, particularly as to concentration of radon and radon daughters and ventilation. It is evident that this must be done periodically, perhaps as often as at 4- to 6-month intervals, because of rapidly changing conditions within the mines caused by removal of the ore and development. In some instances application of control methods must be changed or expanded periodically also. The reference to control methods here means ventilation as this is the only effective known method of reducing the concentration of radon and radon daughters.

Environmental evaluations in the mines should be made in all areas where men are exposed. In areas where exposures to workers may be only for brief intervals, evaluations should be made less frequently. Recommendations for application of control measures should be made only in the areas of lengthy exposure to workers, as in some cases it is economically impossible to reduce concentration levels in the entire mine below the tolerance of 300 micromicrocuries per liter of air of total radon daughters.

Work so far has been designed only to acquire information regarding concentration levels, and actual surveying for the purpose of establishing control measures requires additional work and more time in each mine. Transportation in this area is extremely difficult and expensive, necessitating four-wheel drive vehicles large enough to carry sampling and detection equipment, as well as food, water, spare parts, fuel, and camping equipment. Control measures are extremely difficult to accomplish, as many mines are located in areas where electrical power is not available and water and gasoline must be transported over great distances. In addition, some areas are entirely inaccessible during winter months.

From the above description, it is apparent that the problem in the mines is acute and the personnel and financial resources necessary to furnish guidance to the mine operator in order to adequately control the hazard and to keep it under control are beyond present possibilities. This description applies only to the approximately 400 uranium mines in Colorado, although a hazard from radioactive materials in some nonuranium mines, to a lesser degree, has been noted.

Financial assistance from the 1959 session of the Colorado Legislature was granted to the extent that one additional person for a full year, and 2- or 3-month periods, are to be hired as of July 1, 1959. These people will make routine inspections of the uranium mines on a project designed to gather a minimum amount of information that will serve only to define the extent of the hazard at a particular time. It is felt that this information will be useful to the mine operator in attempting to control the radon and radon daughter con-

centration. It is hoped that this project, along with increased efforts by permanent personnel in the occupational health section, will cover each mine once. We realize that this is inadequate; however, it is a step in the right direction and a practical approach to the problem.

To further facilitate this type of operation and to fully utilize existing facilities available, very close cooperation is extended in this effort with other agencies, such as the Colorado Bureau of Mines, Industrial Commission of Colorado, U.S. Public Health Service, and Atomic Energy Commission. We are hopeful of securing a physician trained in radiological health from the Public Health Service on a loan basis this fall.

Although health hazards associated with the extraction of uranium from the ores are many an dvaried, the problem of control of all hazards, even those concerning radioactive materials, can generally be solved by the application of ordinary industrial hygiene methods.

Joint inspections of the mills are made by the staff of the Occupational Health Section of the Colorado State Department of Public Health and members of the Inspection Division of the Idaho Falls branch of the Atomic Energy Commision.

These inspections are routine and designed to determine compliance with AEC regulations (10 CFR 20) pertaining to radiation and radioactive materials only.

In addition, the Colorado State Department of Public Health conducts plant surveys in conjunction with the Colorado Bureau of Mines and the Industrial Commission of Colorado. These surveys are complete and consist of evaluations of all health hazards in the mills, including those arising from the handling of radioactive materials. The staff of the Occupational Health Section of the Colorado State Department of Public Health are duly appointed deputy mine inspectors by the Colorado Bureau of Mines in order to facilitate this cooperative program.

Personnel and financial limitations do not permit surveys as often as necessary—to the mills—however, plans are being developed to more effectively utilize personnel from other agencies, such as local health departments and factory inspectors, to do part of this work.

PROBLEMS OF WATER POLLUTION WITH RADIOLOGICAL WASTES

Uranium industry operations in southwestern Colorado have raised public health questions regarding stream pollution with radiological wastes. These are problems of interstate concern. For example, the Animas River receives wastes from the uranium milling and processing activities in the vicinity of Durango, Colo., before the stream crosses into New Mexico, where it traverses the Navajo Indian Reservation and flows on to join the San Juan River.

Following a request by the New Mexico Health Department, the Surgeon General of the U.S. Public Health Service commenced hearings in April 1958 on this problem. The next conference is to be held on June 24. Joint studies of the concentration levels of radioactive substances in the Animas River and its borders and a continuing series of interstate meetings regarding the performance and results of the surveys are being conducted jointly by the Public Health Service, Colorado and New Mexico public health agencies. The conferences,

other consultation, surveying, and interpretation of the data, however, have involved many additional agencies, such as the Indian Service and Atomic Energy Commission, the Colorado Game and Fish Department, the local health departments for the areas concerned in the two States, the municipal governments of the cities in the areas, and the Uranium Milling & Processing Corp. Representatives of Utah and Arizona also have been included in the conferences.

1957 RADIOLOGICAL HEALTH AMENDMENT TO THE STATE HEALTH DEPARTMENT ACT

In 1957 the Colorado State Health Department was successful in efforts to obtain passage of an amendment to the State Health Department Act of 1947 to confer, specifically, regulatory powers regarding radiation protection upon the Department.

TECHNICAL ADVISORY COMMITTEE SERVICES AND PROGRAM PROGRESS

The technical advisory committee, appointed following passage of this legislation, has worker intensively with the radiological health staff of the health department, and numerous conferences and meetings have been held with representatives of the many types of governmental, scientific, research, and industrial organizations concerned. Two major accomplishments have been:

(1) Establishment of required registration of radiation machines and radioactive materials with the State health department, made effective in January 1959 by regulation of the State board of health; and

(2) Formulation of first and second drafts of radiation standards and regulations, to be further revised and ultimately adopted by the the State board of health.

Much study and consultation has gone into the drafting of the proposed radiation standards and regulations. Recommendations, standards, and future research findings of the National Committee on Radiation Protection, American Standards Association, Atomic Energy Commission, National Bureau of Standards, and Public Health Service have been considered, and appropriate references are made to them.

Our plan, it is reassuring to note, has met the four elements of desirable State regulation for radiation protection emphasized by the Council of State Governments. As summarized in the winter issue for 1959 of the council's Journal, the elements are:

> * * * (1) primary reliance on flexible State administrative rules and regulations, with a minimum of statutory provisions; (2) establishment of regulations conforming substantially with nationally accepted standards; (3) coverage of all aspects of radiation, hygiene, and safety to regulations and provision for appropriate advance study by all affected agencies; and (4) requirement of registration of radioactive sources.

Coordination with other agencies of the State government is facilitated by our customary cooperative procedure regarding health and safety responsibilities. To illustrate:

The industrial hygienists of the health department are fully credited as deputy inspectors by the State bureau of mines; similar cooperative arrangements are in effect with the State coal mine inspector's office; the State industrial commission and the health department

have a formal agreement assuring interchange of information and services.

Within the State health department close liaison between the occupational and radiological health section and many other sections is, of course, necessary because of the radiological health problems related to water pollution control; radioactive fallout surveillance; food, milk and drug controls; recommended limited use of X-raying in tuberculosis case finding programs; civil defense participation; and precautions against emergencies involving radiation and radioactive materials.

SUMMARY

There are at this time approximately 400 uranium mines supporting a $60 million source materials industry within the State of Colorado. The Public Health Service and the State of Colorado Department of Public Health have been studying the health hazards in this industry. A group of about 3,200 men has been assembled and is being followed to determine their health experience. The record of this group, together with the environmental data, will eventually enable us to assess the hazard associated with exposure to ionizing radiation.

Sufficient time has not elapsed to determine categorically whether or not the health experience of our study group is different from other industry workers; however, the data that are available are disturbing. Our group originally contained about 50 men who had at least 1 year of uranium mining experience prior to 1942. That does not mean that these men worked continuously. However, they worked spasmodically since 1942. Sixteen of these have died in the last 3 years, four from lung cancer. These numbers are too small to permit firm conclusions to be drawn, but they may be indicative of the future developments.

Our environmental data show that the newer mines, working large ore bodies, are reasonably successful in controlling the atmospheric concentrations to radon and its daughters. In the older mines, the workers are still exposed to high levels of these elements. Our 1957 environmental samples showed that in Colorado 50 percent of the active areas exceeded five times the working level for radon daughters. In Arizona, 50 percent of the active areas exceeded four times the working level. These levels may be compared with the concentrations reported to exist in the European mines which probably ranged from 20 to 180 times the working level in the active parts of the mines. In those mines from 50 to 75 percent of the workers contracted lung cancer, after 7 to 27 years of exposure.

Or coverage of the mines is incomplete, but it appears that about 1,500 men are working in roughly 300 uncontrolled, or poorly controlled mines. These mines are primarily in Colorado and Arizona, though all States have some problem areas. It is discouraging to observe that our environmental samples do not show any marked improvement in these mines in the last 2 years.

It is our opinion that although at this time the statistics are inconclusive, there is strong evidence that there should be more effective controls of the airborne radioactive contaminants in uranium mines. If the present situation continues, there is a real possibility that a

number of men will be unnecessarily endangered. Correction measures should be taken immediately.

As a result of joint studies by the State and Federal agencies interested in the health and safety of uranium miners there are definite indications that additional action should be taken to adequately protect the health of individuals engaged in this occupation from radiation hazards.

I would like to add also that our activities are not limited to uranium mining. We do have a registration act. We have an emergency program for accidents regarding radioactive materials. We do inspection of isotopes. Our program is very similar to that outlined by the gentleman from Texas.

Chairman ANDERSON. Do you happen to know whether the law in Wyoming requires the monthly checks of radon in the mines? Wyoming is developing some new mines and some new mills. Since you are familiar with the general area, do you happen to know that?

Mr. JACOE. To my knowledge, Wyoming does not require that. At last report Wyoming had only two or three underground uranium mines. Most of them are open pit mines, and therefore they do not have a problem as yet.

Chairman ANDERSON. The biggest mine in our area is possibly open pit. We have some other types, too.

You mentioned this 4- to 6-month interval for inspection. Do you think that is adequate? If there were funds available would you like to do it more frequently?

Mr. JACOE. Yes. That is a minimum. Actually it would be designed to determine ventilation conditions during warm weather, during transition periods and during very cold weather. Development in these days is very fast and areas are opened up so that the ventilation equipment in use does become inadequate very rapidly.

Chairman ANDERSON. I thought this was a fine presentation. I appreciate Colorado giving us information on it because you have a lot of experience with it.

Mr. Toll has a question.

Mr. TOLL. Mr. Aspinall had to leave to go to the floor of the House, but he asked me to ask these questions for his information.

Do you think that Colorado has sufficient statutory and regulatory authority to protect those working in the mines and mills of uranium operations?

Mr. JACOE. I personally don't feel that we do. The tolerance exists in the Colorado Bureau of Mines law. It does not say "shall not exceed." It says, "should not exceed." Therefore, there is some doubt whether it is enforceable.

Mr. TOLL. How does Colorado police or inspect the mines? Could you indicate how frequently most mines are inspected?

Mr. JACOE. The mines are inspected quite frequently. Once or twice a year at least for safety hazards by the Colorado Bureau of Mines. That does not mean that evaluations are made for radioactive materials.

There are some mines that we have not gone into at all. We have not been able to cover them all since that work is technical and is not done by mine inspectors.

Mr. TOLL. What has Colorado done through its State board of health to secure the necessary personnel in order to make satisfactory number of inspections?

Mr. JACOE. We have added two men to our staff within the last 9 months in addition to the request for funds from the legislature, which was granted for this 1-year emergency program that I outlined in this discussion here: These two men for a 3-month period and one man for a full year period will do nothing but mine survey work in uranium mines only. The results, or the findings, of those three men will determine the request for funds at the next meeting of the legislature, so that we will know in which direction we are heading.

(At this point, Congressman Aspinall returned to the hearing room.)

Mr. TOLL. Mr. Aspinall and I visited one mine in Colorado last fall where the ventilation equipment had broken down and was not operating. Do you have any penalties that you can impose upon a mine operator who operates mines under conditions that are not designed for safe operation?

Mr. JACOE. Not in the health department. Penalties do exist in the mining law of the Colorado Bureau of Mines.

Chairman ANDERSON. I am sure your department does a reasonable job of checking as quickly as you can and trying to make sure that the operators have their plants in operating shape.

Mr. JACOE. Yes. Of course, the coverage is inadequate. We realize that. There are a great number of mines, and very few people to cover them.

Chairman ANDERSON. You had a great many mines that were just gopher holes and mined out pretty quickly.

Mr. JACOE. That is correct.

Chairman ANDERSON. It is difficult to keep track of all of them.

Mr. ASPINALL. May I make this observation, Mr. Chairman? According to your statement, Mr. Jacoe, there are 400 uranium mines in Colorado. Of course some of them are very small mines. Colorado does not have the personnel either in the bureau of mines safety work or in the public health safety work to make very much of an inspection annually.

Mr. JACOE. That is correct. A very quick cursory inspection is made by the bureau of mines' inspectors. As you understand, travel is very difficult in those areas. The area in which most of the mines lie in the Colorado Plateau area, 75 percent being in that area, there are two inspectors of the Colorado Bureau of Mines assigned to that are, and one of them is a recent addition. There was just one man formerly in that area.

Chairman ANDERSON. Thank you very much.

Dr. Visscher, we will be happy to hear from you.

Dr. VISSCHER. Mr. Anderson, I am very happy to be able to contribute something to this hearing in connection with problems of State and Federal cooperation and regulation of ionizing radiation sources.

The State of Minnesota has adopted a slightly different point of view from that of other States with regard to at least one aspect of this problem. The State of Minnesota has not been involved in any active regulation of ionizing radiation sources until very recently. As a

matter of fact, under statutory authority the Minnesota State Board of Health has adopted on December 4, 1958, a group of regulations on ionizing radiation, a copy of which I have supplied to the committee.

(The document referred to follows:)

MINNESOTA STATE BOARD OF HEALTH REGULATIONS ON IONIZING RADIATION

Reg. 1150. *Declaration of purpose and scope*

Whereas, ionizing radiation can be instrumental in the improvement of health, welfare, and productivity of the public if properly utilized, and may impair the health of the people and the industrial and agricultural potentials of the State if improperly utilized, and the Board of Health has the statutory authority and duty to adopt, alter, and enforce regulations for the preservation of the public health and thereby to control sources of ionizing radiation, and the handling, storage, transportation, use, and disposal of radioactive isotopes and fissionable materials within this State, and to observe their effect upon human health, it is hereby declared to be the purpose of the Board of Health in these regulations to secure information concerning the nature and extent of the employment of radiation-emitting equipment and radioactive materials within this State, and to control or prevent dangers to health from ionizing radiation without limiting or interfering with the constructive uses of radiation. Nothing in these regulations is to be construed to limit the kind and amount of radiation that may be intentionally applied to a person for diagnostic or therapeutic purposes by or under the direction of a licensed practitioner of the healing arts.

Reg. 1151. *Definitions*

As used in these regulations, the following terms shall have the meanings respectively ascribed to them:

"Radiation" means ionizing radiation regardless of whether or not the qualifying adjective is used with the term. The definition therefore includes gamma rays and X-rays, alpha and beta particles, protons, and other nuclear particles, but does not include sound or radio waves, or visible, infrared or ultraviolet light.

"Person" means any person, association, corporation, or legal entity, and includes agencies of the State and of the subdivisions of the State.

"Appropriate limit" or "appropriate limits" mean the maximum permissible dose or doses of radiation that, in the light of present knowledge, may be administered to the whole body or a given part of the body of a human being with the reasonable expectation that such administration will not cause any appreciable bodily injury to that person at any time during his lifetime. The quantitative amounts of the "appropriate limits" or maximum permissible doses are presumed to be the quantitative standards established for maximum permissible doses as set forth in the recommendations of the National Committee on Radiation Protection and Measurements and published in the handbooks of the National Bureau of Standards, specifically, Handbook 52, "Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water," U.S. Department of Commerce, National Bureau of Standards, March 1953, and Handbook 59, "Permissible Dose from External Sources of Ionizing Radiation," U.S. Department of Commerce, National Bureau of Standards, September 24, 1954, with Addendum dated April 15, 1958.

"Radioactive material" is any material or materials, solid, liquid, or gas, that emit radiation spontaneously.

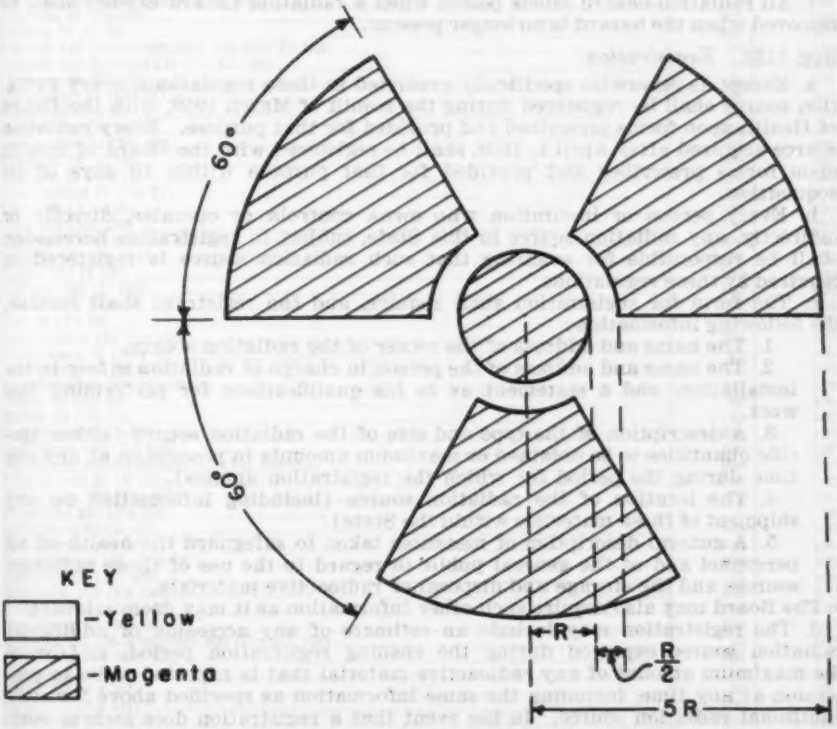
"Radiation machine" means any machine, mechanism, electronic arrangement, or device that emits radiation when energy is applied to it or when the associated control instruments or devices are operated.

"Radiation source" means any radiation machine or machines and/or radioactive material or materials as defined in these regulations.

"Radiation hazard" means any condition that might result in the exposure of persons to radiation in excess of the appropriate limit or limits.

Reg. 1152. *Radiation symbol and labeling*

a. Each radiation sign or label shall bear the standard symbol specified in these regulations and appropriate printed warning such as CAUTION-RADIATION, in capital block letters. The standard symbol for designating any radiation hazard shall be a circle with three propellerlike blades arranged around it as illustrated:



The boundaries of the three blades of the propellerlike symbol shall be confined within a 60° sector of the circle delineated by their outer edges, and said blades shall be symmetrically distributed 60° apart. The radius (R) of the central circle of the symbol shall be the standard for its other dimensions as follows: overall radius of symbol=5R; shortest distance from circumference of central circle to inner edge of nearest blade=R/2. The standard color specification shall be a background of yellow with lettering and distictive symbol in purple (magenta). The symbol and lettering shall be as large as practical, consistent with the size of the equipment or material upon which they appear.

b. The use of the specified radiation symbol for any other purpose than designating or referring to a radiation hazard is expressly prohibited.

c. All containers of radioactive material for storage and disposal, storage areas, work areas, and other normally occupied areas where a radiation hazard may exist shall be posted with accepted radiation-hazard labels, except where such labels may be a source of disturbance to patients.

d. Any areas where a radiation hazard may exist on a frequent or infrequent basis, but which are not readily accessible and are so situated as to be occupied only under infrequent and special circumstances, shall be posted with accepted radiation-hazard labels.

e. All areas that are readily accessible but not normally occupied, and where a radiation hazard may exist on a frequent or infrequent basis, shall be suitably fenced off and posted with the accepted radiation-hazard label.

f. All radiation-hazard labels posted when a radiation hazard existed shall be removed when the hazard is no longer present.

Reg. 1153. *Registration*

a. Except as otherwise specifically exempted in these regulations, every radiation source shall be registered during the month of March 1959, with the Board of Health upon forms prescribed and provided for that purpose. Every radiation source acquired after April 1, 1959, shall be registered with the Board of Health upon forms prescribed and provided for that purpose within 10 days of its acquisition.

b. Every person or institution who owns, controls, or operates, directly or indirectly, any radiation source in this State, subject to registration hereunder, shall be responsible for ensuring that such radiation source is registered as required by these regulations.

c. The form for registration shall require, and the registrant shall furnish, the following information:

1. The name and address of the owner of the radiation source.
2. The name and address of the person in charge of radiation safety in the installation, and a statement as to his qualifications for performing this work.
3. A description of the type and size of the radiation source (either specific quantities to be obtained or maximum amounts in possession at any one time during the period for which the registration applies).
4. The location of the radiation source (including information on any shipment of these materials within the State).
5. A general description of measures taken to safeguard the health of all personnel and of the general public in regard to the use of those radiation sources and the storage and disposal of radioactive materials.

The Board may also require such other information as it may deem relevant.

d. The registration may include an estimate of any accession of additional radiation source expected during the ensuing registration period, and/or of the maximum amount of any radioactive material that is expected to be in possession at any time, including the same information as specified above for such additional radiation source. In the event that a registration does include such an estimate and such information, no further registration of such additional radiation source during the ensuing registration period shall be required. Any accession in excess of the estimate, and any accession of radiation sources not so registered, shall be registered promptly in compliance with these regulations.

e. Each registration pursuant to these regulations shall be renewed biennially during the month of January of odd numbered years so long as the activity requiring registration continues. If there has been no substantial change in the matters described in the last prior registration or renewal, the renewal of the registration shall so state. If there has been any accession of additional radiation sources or other substantial change in the matters described in the preceding registration or renewal, the renewal shall state the accession or other change and give the information relating to such accession or other change that would be required upon original registration.

f. The registration requirements shall not apply to facilities subject to Regulation 1158, nor to radioactive materials not in excess of the kind and quantity specified in the following table:

Registration exemption possession limits

	Unsealed (microcuries)	Sealed (microcuries)
Antimony 124 (Sb 124)	10	100
Arsenic 76 (As 76)	100	100
Arsenic 77 (As 77)	100	100
Barium 140-Lanthanum 140 (Ba La 140)	10	100
Beryllium 7 (Be 7)	500	500
Cadium 109-Silver 109 (Cd Ag 109)	100	100
Calcium 45 (Ca 45)	100	100
Carbon 14 (C 14)	500	500
Cerium 144-Praseodymium 144 (Ce Pr 144)	10	100
Cesium 137-Barium 137 (Cs Ba 137)	10	100
Chlorine 36 (Cl 36)	10	100
Chromium 51 (Ch 51)	500	500
Cobalt 60 (Co 60)	10	100
Copper 64 (Cu 64)	500	500
Europium 154 (Eu 154)	10	100
Fluorine 18 (F 18)	500	500
Gallium 72 (Ga 72)	100	100
Germanium 71 (Ge 71)	500	500
Gold 198 (Au 198)	100	100
Gold 199 (Au 199)	100	100
Hydrogen 3 (Tritium) (H 3)	2,500	2,500
Indium 114 (In 114)	10	100
Iodine 131 (I 131)	100	100
Iridium 192 (Ir 192)	100	100
Iron 55 (Fe 55)	500	500
Iron 59 (Fe 59)	10	100
Lanthanum 140 (La 140)	100	100
Manganese 52 (Mn 52)	10	100
Manganese 56 (Mn 56)	500	500
Molybdenum 99 (Mo 99)	100	100
Nickel 59 (Ni 59)	10	100
Nickel 63 (Ni 63)	10	100
Niobium 95 (Nb 95)	100	100
Palladium 109 (Pd 109)	100	100
Palladium 103-Rhodium 103 (Pd Rh 103)	500	500
Phosphorus 32 (P 32)	100	100
Plutonium 239 (Pu 239)	10	100
Polonium 210 (Po 210)	1	10
Potassium 42 (K 42)	100	100
Praseodymium 143 (Pr 143)	100	100
Promethium 147 (Pm 147)	100	100
Radium 226 (Ra 226)	10	100
Rhenium 186 (Re 186)	100	100
Rhodium 105 (Rh 105)	100	100
Rubidium 86 (Rb 86)	100	100
Ruthenium 106-Rhodium 106 (Ru Rh 106)	10	100
Samarium 153 (Sm 153)	100	100
Scandium 46 (Sc 46)	10	100
Silver 105 (Ag 105)	10	100
Silver 111 (Ag 111)	100	100
Sodium 22 (Na 22)	100	100
Sodium 24 (Na 24)	100	100
Strontium 89 (Sr 89)	10	100
Strontium 90-Yttrium 90 (Sr Y 90)	1	10
Sulfur 35 (S 35)	500	500
Tantalum 182 (Ta 182)	100	100
Technetium 96 (Tc 96)	10	100
Technetium 99 (Tc 99)	10	100
Tellurium 127 (Te 127)	100	100
Tellurium 129 (Te 129)	10	100
Thallium 204 (Tl 204)	500	500
Thorium (Natural)	500	5,000
Tin 113 (Sn 113)	100	100
Tungsten 185 (W 185)	100	100
Uranium (Natural)	500	5,000
Uranium 233 (U 233)	10	100
Uranium 234-Uranium 235 (U 234-235)	500	5,000
Vanadium 48 (V 48)	10	100
Yttrium 90 (Y 90)	10	100
Yttrium 91 (Y 91)	10	100
Zinc 65 (Zn 65)	100	100
Radioactive byproduct materials other than listed above	10	100

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g. The registration of any radiation source or the acknowledgment by the Board of Health of any such registration shall not imply the approval by the Board of Health of the construction, operation, use, storage, transportation, disposition or method of handling of such radiation source, but shall serve merely as notice to the Board of Health of the facts stated in such registration. No person shall publicize or refer to the fact of such registration in such a manner as to suggest or imply that the Board of Health has supervised or approved any registered radiation source.

Reg. 1154. *Investigations*

Any person in control of any radiation source in this State, upon request by any member of the Board of Health or any agent of the Board of Health duly authorized by it for this purpose, shall permit such member or agent to inspect any such radiation source and the place and premises upon and within which such radiation source is located, and shall furnish such information relevant to an evaluation of the hazard to health actually or potentially presented by such radiation source as may be requested by such member or agent. It will be the responsibility of the Board of Health to provide investigators that have appropriate Federal security clearance.

Reg. 1155. *Accident reports*

a. When an accident or other situation occurs which results or may result in the radioactive contamination of a person, animal or the environment, or the exposure of a person or persons to ionizing radiation, in a manner or to a degree greater than ten times the appropriate limits, it shall be the responsibility of the owner, operator, radiation safety officer and person in charge of the radiation source involved to notify the Board of Health by telephone immediately upon discovery of the situation, and to report the facts and circumstances of the occurrence in detail, in writing, within seven days thereafter; provided that only one person need make such reports and that reports by the owner, operator, radiation safety officer or person in charge of such radiation source shall be sufficient under this regulation.

b. When an accident or other situation occurs which results or may result in the radioactive contamination of a person, animal or the environment, or the exposure of a person or persons to ionizing radiation, in a manner or to a degree greater than but less than ten times the appropriate limits, it shall be the responsibility of the owner, operator, radiation safety officer and person in charge of the radiation source involved to report the facts and circumstances of the occurrence in detail, in writing, within seven days thereafter; provided that only one person need make such reports and that reports by the owner, operator, radiation safety officer or person in charge of such radiation source shall be sufficient under this regulation.

c. When a theft or loss of a radiation source occurs, the owner, operator, radiation safety officer or person in charge shall notify the Board of Health by telephone immediately upon discovery of the situation and shall report all known facts and circumstances relating to the occurrence in writing within seven days thereafter.

Reg. 1156. *Transportation and storage of radioactive materials*

a. Radioactive materials shall be transported, stored, and kept in such a manner as to ensure that the dose rate therefrom shall not exceed appropriate limits, as defined herein.

b. Carriers, facilities, vaults or rooms used for transporting or storing materials that may emit radioactive gases shall be suitably ventilated in such a manner that the gases do not constitute a radiation hazard.

c. When there is any possibility that chemical, radiation, or other action might weaken or rupture the container of radioactive materials sufficiently to cause leakage therefrom, the container shall be provided with a suitable secondary tray or catchment adequate to retain the entire amount of radioactive materials.

d. Each container of radioactive material in transit in this State shall, in addition to bearing the standard radiation-hazard symbol specified in these regulations, be labeled in such a manner that the kind and quantity of material, the date of measurement, and the name of the agent of the consignor responsible for the material can be easily and quickly determined.

e. Transit and storage containers for radioactive material in excess of 1,000 times the values given in Regulation 1153f shall be designed to be resistant to damage from impact, windstorm, fire, flood, and earthquake. Containers shall

be structurally sound over the period of intended use with due regard to corrosion, radiation, and temperature effects that may develop.

f. Suitable provision shall be made to minimize the hazard to emergency workers in the event of impact, windstorm, fire, flood, and earthquake, in any situation in which the potential for such a hazard exists.

Reg. 1157. *Shoe-fitting machines*

Because of the public health hazard involved in the indiscriminate use of radiation, it is hereby prohibited for any person, partnership, association, or corporation to operate or maintain within the State any fitting devices or machines which use fluorscopic, X-ray, or radiation principles for the purpose of fitting and selling footwear through commercial outlets.

Reg. 1158. *Nuclear reactors and facilities*

a. The term "nuclear reactor" as used herein means any installation, machine, device, or assemblage or collection of installations, machines or devices, that does or is intended or designed to contain a controlled self-sustaining neutron chain reaction. The term "facility" as used herein includes nuclear reactors and also includes any plant, installation, or device for processing or reprocessing nuclear fuel, and any plant, installation, device, place, or location for disposal of radioactive wastes or for temporary or permanent disposal of radioactive materials, equipment, or nuclear fuel.

b. Before the construction of any nuclear reactor or facility is started within this State a general description thereof shall be submitted to the Board of Health containing such information as may be necessary or appropriate to a determination of any actual or potential hazard to or effect upon the public health, and specifying the following information: (1) The name, address, and corporate or individual character of the person who will own the facility, and, if different, of the person who will operate it; (2) the name and address of the principal contractors who will construct the facility; (3) a description of the general character of the means employed to utilize nuclear energy; (4) a statement as to the character, quantity, and source of the materials that will be utilized as a source of nuclear energy; (5) a description of the precise location of the facility with reference to any relevant known topographical, subsurface or meteorological features of the location, such as adjacent bodies of water; (6) a statement as to plans for monitoring levels of radioactivity in the various phases of the environment; (7) a statement as to the anticipated quantity and means of storage and disposition of any radioactive waste materials that will result from the operation; (8) a preliminary statement as to the standards and measures that will be employed to ensure the safety of personnel employed in or near the proposed facility; (9) a preliminary statement as to the standards and measures that will be employed to prevent radioactive contamination of air, water, and other elements of the environment; (10) a preliminary statement specifying in standard scientific terms and quantitative units the nature and amount of radioactivity that will be permitted to pass into the environmental air, water, and other elements within a specified period of time, stating in what manner and form such radioactivity will be permitted to pass into the environment and describing the safety checks that will be employed to ensure that no larger quantity of radioactivity escapes into the environment; and (11) a preliminary description of the maximum credible accident which might occur at the proposed facility and how it will be controlled, together with any other information relevant to a complete hazard report.

c. No part of the construction of a nuclear reactor or facility shall be started within this State without the express approval of the Board of Health until 30 days after the submission to it of such description and information. Within 30 days after such submission the Board of Health ,or its duly authorized agents, may require the submission of additional information relating to any specific matter referred to herein, and the Board of Health, or its duly authorized agents, may object to any part of the proposed design, description, plans, method of operation, standards, or safety measures, upon the ground that the public health is endangered, and may require such modification in such design, plans, method of operation, standards, or safety measures as will eliminate the danger to the public health. In the event that within 30 days after the submission to it of the description, information, design, and plans for a proposed nuclear reactor or facility the Board of Health does not object to any part

thereof, the facility may be constructed in accordance with the description, design, and plans submitted to the Board of Health.

d. If there is any substantial deviation from or hange in the description, design, or plans as submitted to the Board of Health, full information relating to such deviation or change shall be submitted to the Board of Health immediately.

e. The Board of Health shall be notified of the date when it is proposed that a nuclear reactor shall be put into operation. Such notification shall specify any deviations from, or changes in, the description, design, or plans as previously submitted to the Board of Health and the facility as actually constructed. At least 30 days, and not more than 60 days, prior to this proposed date, the owner of the reactor shall apply to the Board of Health for its approval to operate the facility. No reactor shall be operated in this State until the owner has received, and is the possession of, such an approval.

f. Whenever it is proposed to alter, enlarge, move, or substantially modify or change any existing nuclear reactor or facility, the description, design, and plans of such proposed alteration, enlargement, move, modification, or change shall be submitted to the Board of Health at least 30 days prior to the time that it is proposed to initiate such work, and these regulations shall apply to any substantial alteration or enlargement as though such work were the construction of a new facility.

g. The operator of each nuclear reactor or facility within this State shall report to the Board of Health at least annually, stating the measures that have been taken during the preceding year to monitor and measure the nature and amount of radioactivity discharged or allowed to escape into the environment from such facility, and stating in standard scientific terms and quantitative units the nature and quantity of radioactivity that has been discharged or allowed to escape into the environment during the preceding year.

h. When an accident or other situation occurs in this State in the operation of a nuclear reactor or facility which results or threatens to result in the radioactive contamination of a person, animal, or the environment, or the exposure of a person to, or the escape into the environment of, ionizing radiation in a manner or to a degree or in a quantity different or greater than specified in the description and information last previously filed with the Board of Health, it shall be the duty of the owner and operator and of the person then in charge of such facility to have notification of such occurrence communicated to the Board of Health by telephone immediately upon the discovery of the facts, and to have all facts and circumstances of the occurrence reported in detail in writing to the Board of Health within seven days thereafter.

i. Any facility in design or under construction as of January 1, 1959, shall not be exempt from the provisions of these regulations.

Reg. 1159. *Exemptions*

These regulations shall not apply to the following sources or conditions:

a. Natural radioactive materials of an equivalent specific radioactivity not exceeding that of natural potassium.

b. Timepieces, instruments, or devices containing self-luminous elements, except during manufacture or repair of the self-luminous elements themselves.

c. Electrical equipment that is not intended primarily to produce radiation and that, by nature of design, does not produce radiation at the point of nearest approach at a weekly rate higher than one-tenth (1/10) the appropriate limit for any critical organ exposed. The production testing or production servicing of such equipment shall not be exempt.

d. Radiation machines not being used in such manner as to produce radiation.

e. Any radioactive material being transported in conformity with regulations adopted by the Atomic Energy Commission or the Interstate Commerce Commission and specifically applicable to the transportation of such radioactive materials.

f. Such other radiation sources as may be specifically designated by the Board of Health as exempt by virtue of being known to be without hazard to health.

Reg. 1160. *Responsibility*

a. Every person who owns or controls any radiation source subject to these regulations shall ensure that such radiation source is used only under the direction of a competent person who is responsible for the radiation safety therein, and whose name has been reported to the Board of Health.

An owner or registrant may be the person responsible for radiation safety.

b. The person in charge of the radiation safety in the installation shall have the following responsibilities:

1. He shall inform himself of the hazards attendant upon the presence of radiation in the installation and, if necessary to this end, obtain the services of a qualified expert.

2. He shall provide, or cause to be provided, any necessary instruction concerning the attendant radiation hazards and safe working practices to all employees whose duties necessitate the handling of radioactive material or the operation of any machines that produce radiation in amount that leads to hazard, and to all other employees who are not regularly employed at such work but who may occasionally be exposed to radiation.

3. He shall ensure beyond reasonable doubt that all persons working with radiation machines or radioactive material, and all authorized visitors to areas where radiation may be present, are properly and adequately instructed in the use of all necessary safeguards and procedures and are supplied with auxiliary devices as may be necessary for safety.

4. He shall ensure beyond reasonable doubt that no radioactive material (including that in patients, animals and equipment) is allowed to leave the control of the radiation user under circumstances that may subject other persons to radiation in amounts exceeding appropriate limits.

5. He shall ensure beyond reasonable doubt that any area, inside or outside the installation, normally occupied by adults not primarily engaged in radiation or associated work cannot be subjected to radiation levels exceeding the appropriate limits.

6. He shall notify the building superintendent or other appropriate official of the existence of any areas not normally occupied but in which hazardous radiation exposure may normally take place (e.g., an air-conditioning-equipment room beneath X-ray installation).

7. He shall notify the building superintendent or other appropriate official of the existence of any conditions or situations that, while not normally considered a radiation hazard, may become a hazard under special or unusual circumstances (e.g., entrapment of waste in a drain line).

8. He shall, by means of appropriate surveying or monitoring procedures, ensure that radioactivity discharged to the atmosphere, at any point where persons may breathe the air, shall be maintained at an average concentration of radioactivity below the appropriate limits.

9. He shall keep such records and perform such tests as may be presecribed by the Board of Health and as necessary to an evaluation of the hazards attendant upon the presence of radiation in the installation.

c. Every employee, authorized visitor and other persons coming upon the premises of such an installation shall be responsible for using such safety devices as are furnished for his protection and for carrying out all radiation-safety rules that concern or affect his conduct.

Adopted by Minnesota State Board of Health December 4, 1958.

Dr. VISSCHER. The history of the action in Minnesota is approximately as follows: The 1957 legislature made specific the authorization to the State board of health to regulate sources of ionizing radiation that might be health hazards. There might have been general authorization under the basic law setting up the State board of health for such activities, but it was felt that it would be better to have it made specific. In that same year Gov. Orville Freeman appointed a State committee on atomic energy problems, comprising a cross section of knowledgeable persons from industry, from public health, from scientific areas, from labor, and this commission undertook as one of its problems a study of what the role of the State of Minnesota should be in relation to regulation of ionizing radiation sources.

I should like to point out that the Governor's committee in Minnesota had no intention when it started out its activities to become interested in environmental radiation problems specifically. Its charge was atomic energy development problems. But in connection with this general study it soon came to the conclusion that if it was to look

at the problem broadly, it had to know what the environmental radiation problems in the State were, what the natural sources of radiation might be, and also what the situation might be with respect to additions of radioactive material from atmospheric fallout.

This became essential because if one is to have a baseline for study of the influence of nuclear reactors, for example, on environmental radioactivity in the general location of the reactor, it is necessary to know what the prior environmental radiation in those vicinities is.

I may come back to this point in a moment, but before doing so I should like to point out in general what the character of the Minnesota State Board of Health regulations and activities are.

In the first place, the Minnesota State board has specifically excluded at the present time any attempt to limit the kind and amount of radiation that may be intentionally applied to a person for diagnostic or therapeutic purposes by or under the direction of a licensed practitioner of the healing arts. It has felt that although in the future there might be some reason for setting up specific maximum tolerable doses that at the present time it would not be wise to try to regulate the medical use—the legal medical use of radiation in medical therapy or diagnosis.

Mr. RAMEY. May I ask a question there?

Dr. VISSCHER. Yes, sir.

Mr. RAMEY. In connection with not regulating your medical uses of X-rays, does this go as far as also the machine itself? Is it possible not to regulate the doctor in his prescription of treatment, but to require registration of the machine and safety standards as to the machine itself?

Dr. VISSCHER. In this regard, an important aspect of the regulations is the requirement of registration, not simply of every installation, but each source that is used. You will see on page 3 of the document which I gave you the statement with regard to provisions for registration. Every source is to be registered, and the operator of the machine, if that is the source, must be indicated, and the training and qualifications of that operator.

The State board of health requires that its representatives may be permitted to investigate the use of any source of ionizing radiation and requires that the owner and operator, each person who owns or controls, as you will see on page 10, any radiation source subject to these regulations shall insure that such radiation source is used only under the direction of a competent person who is responsible for the radiation safety therein and whose name has been reported to the board of health.

Further down the page it details the type of legal responsibility that this person who owns or controls a radiation source has.

Rather than setting up specific dosage requirements with regard to the medical use of ionizing radiation, the legal responsibility for responsible use is placed upon the owner or operator.

Particularly, Mr. Chairman, I would like to call attention to regulation No. 1158 on page 7 of the document that you have dealing with nuclear reactors and facilities. I believe Minnesota is the only State up to the present time in which the State board of health has undertaken responsibility for definitive control of nuclear reactors within its boundaries. As has been pointed out before this afternoon, there

is a gray zone of rather indefinite authority and responsibility between Federal and State bodies in this regard.

I should like to point out to the committee the reasons that the State board of health and the advisory committee which worked with it from the Governor's Committee on Atomic Energy Development Problems, for introducing this element in the State board of health regulations.

First let me say that there is no inclination to doubt the very great amount of knowledge and information and usefulness in the Atomic Energy Commission of the United States with respect to technical problems in relation to the operation of nuclear reactors. Nevertheless, it was felt first of all that the State board of health is legally responsible to the people of the State for all of health protection matters and cannot properly evade a responsibility in this area. It does not mean it has to be solely responsible, but it cannot evade some responsibility, gentlemen.

Secondly, the local bodies, the local boards of health and other State agencies, do have access to information that is not necessarily available or readily available or obvious to national bodies. For example, in connection with the location of a nuclear reactor, the general underground water situation becomes a matter of considerable importance. Knowledge with regard to the direction and nature of underground water streams is of significance in connection with this problem. Furthermore, the location with respect to the sources of major water supplies for metropolitan districts is important.

I may point out in passing that the first major reactor that is being installed in the State of Minnesota is being installed at Elk River, just on the banks of the Mississippi, a very few miles away from the point of supply of drinking water for a population of a million or a million and a quarter people. It is open to question, as a matter of fact, as to whether that was a very good place to locate that reactor.

Chairman ANDERSON. Doctor, if it were open to question—and I am not sure I completely agree with you that it was—it certainly is a part of the responsibility of the State of Minnesota to inquire into it. Whether the decision was right or wrong to put it at Elk River, the State of Minnesota has a right to find out whether the welfare of its people is being adequately protected.

Dr. VISSCHER. That is our feeling.

Chairman ANDERSON. In the Detroit Edison case, the Atomic Energy Commission not only paid no attention to the protests of the people of Michigan, but paid no attention to the advice of its own reactor safeguards committee. So I am not so sure that you can rely too completely on any one group. It might be well to have an extra group around once in a while to say we would like to look at this, too.

Dr. VISSCHER. That is exactly the way we feel about it. It is for this reason, as a matter of fact, because we feel that there is a State regulatory body with more direct responsibility, more direct sensitivity to the needs and the points of view of the citizens of a State, that such regulatory bodies should have some definite legal authority in these matters.

Chairman ANDERSON. May I just point out to you that my own State is not a rich State. We have a great deal of trouble with our budget every round. You must recognize that if you do not have a

million people living in a State it is difficult. If a number of reactors were to be built in our State, we would have a great deal of difficulty financing the technical knowledge to pass upon the process of each reactor. That is one of the reasons which prompted me at least to try to add to the legislation the requirement that there must always be a report of the reactor safeguards committee because those people have the technical knowledge and can make a general report. Then when that report is available, the people within the State can look at it and perhaps make a decision as to whether that seems to be wise in their own State, and have a chance to come into court or at least come into contention and say something about it. I am glad that you recognize that there is a responsibility in the State, which I don't believe the State has ever surrendered to the Federal Government, to look after the health and welfare of its own people. We have had a lot of discussion of what was surrendered to the Federal Government under the commerce clause and if these things were not specifically reserved and so forth, and all that. We have had many theories. I have never heard that the welfare and health of the people has been completely surrendered, at least, to the Federal Government.

I am happy to say that I am pleased that the State of Minnesota is taking a look at it. I would say in complete frankness to you that I am not so sure that you have a right to say that a reactor shall not be licensed. That is something that we will have to explore very carefully between each other, or we will get into trouble. But I do believe you have a right to take an awfully good look at it and express yourself very, very forcibly on whether you think it is good in the long run for the people of your State.

Dr. VISSCHER. Senator Anderson, I am sure that the people of Minnesota are aware of the fact that there is a real legal question as to how much finality there may be in the decisions with regard to where the AEC may establish reactors. On the other hand, I would like to introduce this into your committee's thought. Take the case of the Elk River reactor; the AEC is building it. It will turn it over to a private organization, and it will become private property after a small number of years. That raises quite a different question.

Chairman ANDERSON. There is a different question. I was very happy to try to help Senator Humphrey and others to get that Elk River reactor going, because I think it would be a fine thing. The AEC is building it. The AEC will own it. As long as the AEC is building it and owning it—I don't want this to be misunderstood—I would be very careful in how I declared the right of the State of Minnesota to hold it up, because I do think that is a gray area where we have not yet established the line of authority. But once that is turned over to a private company to operate, whatever that company may be, whether it is a cooperative or privately owned utility, then I do think the State of Minnesota has some responsibility, and may have quite a bit of authority.

Dr. VISSCHER. I don't think there is any question in anyone's mind as to whether the State of Minnesota is going to try to prevent the operation of this reactor. The State of Minnesota is very much interested.

Chairman ANDERSON. This record might get confused. I don't want somebody to pick it up and say that you are going to oppose it. You do not intend to oppose it.

Dr. VISSCHER. No; there is no opposition, as a matter of fact.

Chairman ANDERSON. Yes; I think I talked to your Governor and received that sentiment.

Dr. VISSCHER. There is only the feeling that we should before it is put in operation take all of the precautions that are reasonable, including precautions to find out exactly what the level of environmental radioactivity in the vicinity is, so that we will have a base line to operate from if there should be an accident or in operation some elevation in dosage.

Chairman ANDERSON. I think I would agree with you. I think one of the most arresting or at least sobering statements I read in a long while was the statement with reference to the Windscale reactor in England, where there was an incident, and where a very prominent member of the British Government said, "We will not attempt to"—I am not trying to quote his exact words—"clean this up. There is too much problem to it. It will stand there for at least 200 years." That is a long time. You would not want that to happen at Elk River, and neither would I. I judge that is your point.

Mr. VISSCHER. That is our point.

Chairman ANDERSON. Mr. Toll, counsel for the committee, has a question.

Mr. TOLL. Dr. Visscher, there are some legal arguments that could be made that the Federal Government has preempted the field of reactor licensing. But without getting into those, as a question of policy, I wonder whether if you divide the responsibility or share the responsibility between the Federal and State Governments as to the licensing of these reactors, whether it is the best thing to do from the public's point of view? If the responsibility rests on one group, and they know that they have to make the decision—say the Federal Government—as to the safety of that reactor without passing the buck to any degree to the State government, is that perhaps a better procedure than if the Federal Government says, "Well, we are not real sure here, but we will buck it to the State of Minnesota, and let them take a look at this reactor, too, and if they think it is all right, then we have done our job." Is this perhaps putting responsibility on the State of Minnesota before it is qualified and ready to assume that responsibility?

Dr. VISSCHER. Of course, you have a very important point, if it is extended generally to States that are not ready in any way, shape or manner, to assume that responsibility. I would say at the present moment the State of Minnesota does not have technically qualified personnel in its own department of health to do the whole job. This would be true. On the other hand, I really can't see why the Atomic Energy Commission cannot supply the technical know-how to assist the State governments in coming to some of these decisions.

Chairman ANDERSON. That is just exactly what I had hoped you would say. I do believe that it where the Atomic Energy Commission can be of tremendous help to you. You do not have, and the individual States will not have the technical skill necessary, particularly the poorer States. New York can make it, maybe. Pennsylvania might be able to. California can. But what are you going to do in some of these States where it is a tremendous problem? You cannot possibly assemble the staff. But you ought to be able to get all the information

from the Federal Government, particularly from the AEC and the Public Health Service, and then be able to come to a decision yourself.

Dr. VISSCHER. Mr. Chairman, may I add something to this point?

Chairman ANDERSON. Surely.

Dr. VISSCHER. I think that the States are very anxious to get all of the help they can from the Federal Government in these matters, even in regard to monitoring of environmental radioactivity unrelated to the nuclear reactor problem. But the Atomic Energy Commission itself has in its own words limited funds for this type of activity. It is my own opinion that it is not exclusively a Federal responsibility to do environmental radioactivity monitoring. There is a legitimate reason why the States themselves, particularly the more well to do States, should amplify the programs of the Atomic Energy Commission with respect to a number of types of environmental contamination. With regard to the contamination of foodstuffs, for example, one can hardly expect the Atomic Energy Commission to go out into every one of 40 or 50 different soil type areas in a farm State like Minnesota and see what is happening to accumulation of certain radioactive isotopes in foodstuffs in those areas. Nevertheless, this may be something, and in my opinion it is something that the State Department of health should take responsibility for, to amplify what the AEC is doing.

Chairman ANDERSON. I did not mean to take you so far and so long, because we have a requirement to get through with this in a very short time, but I did want you to express yourself on that point, and I am glad you did. You go right ahead with your statement.

Dr. VISSCHER. With regard to the regulatory activities of the State of Minnesota, the entire program is in the document you have for your records. I believe, Mr. Chairman, that I have said what I consider to be most important except one or two final words.

I think we are in a situation of flux in which we are feeling our way, not only in the Federal area, but in the State area. We must be prepared, as the other participants in the testimony this afternoon have pointed out, to see new needs and modify our approaches in the light of the needs that appear.

Thank you very much.

Chairman ANDERSON. Thank you. May I say to you, Doctor, that we received from you, as you well know, a very good statement for the fallout hearings. We will be very happy to include that. Because this was a final statement, we were very pleased to know you were coming here today.

Before we get off this entirely, and before we lose our panel, I would like to ask this general question, and I would hope that the three first speakers might comment on it, and maybe Dr. Visscher, if he wishes: Do you think the Atomic Energy Commission or the Public Health Service should provide greater financial and technical assistance in the employment and training of personnel in State radiological regulatory agencies? In other words, I am trying to say, are you getting along all right, or do you think you ought to have help, and if you ought to have help, should it come to you from AEC? Should it come from the Public Health Service? Should it come to you from both?

Dr. Wilson, would you wish to comment on that?

Dr. WILSON. Yes, sir. Mr. Chairman, you saved the day there when you changed it to "and." I think both the Atomic Energy Commis-

sion and the Public Health Service in this interim period certainly ought to be able to support the States.

Chairman ANDERSON. You find the need of some help?

Dr. WILSON. Yes, sir.

Chairman ANDERSON. How about you, Mr. Jacoe?

Mr. JACOE. I find we are greatly in need of help, financial and personnelwise. However, I do feel that the Public Health Service would be more acceptable inasmuch as they have greater experience in dealing with the States and have a well-established mechanism.

Chairman ANDERSON. Dr. Kleinfeld?

Dr. KLEINFELD. I believe all the help that one can make available would be beneficial, even to the very large industrial States. I believe this help has been forthcoming from both the Public Health Service and the Atomic Energy Commission in the form of fellowships, in the form of training at the various centers. I think more of that can and should be done, and expedited to permit a maximum of training and indoctrination where it is most in need.

Chairman ANDERSON. Dr. Visscher, do you care to comment?

Dr. VISSCHER. Yes. Thank you very much. It is my own opinion, and I think it is shared by most of my associates in the State of Minnesota, on the Governor's commission, that it would be desirable if the Public Health Service were to have major responsibility in health protection areas. I think that there is a very important role for the AEC in connection with the industrial applications, and the industrial reactors.

To answer your question very specifically, I would be happier to see the health and biological apects of the program put into agencies that are primarily concerned with such matters.

Chairman ANDERSON. I saw Dr. Wilson reaching for the microphone. Go right ahead.

Dr. WILSON. Mr. Chairman, so there could be no misunderstanding, from the health aspect—particularly from the public health viewpoint—naturally most States are much more in the habit and of the well-established channels for expecting support from the Public Health Service. However, I was trying to answer you originally from the viewpoint of this interim period when we know that we can't just jump overnight. I am sure that Dr. Visscher and I have probably almost unanimous agreement that we would not be able in the State health department approach to jump immediately without any reference to the Atomic Energy Commission support we so badly need. We need to concentrate the health operation in the health channels.

Dr. VISSCHER. I would not advocate tearing the house down until you have a new one.

Chairman ANDERSON. I do think we would all agree that when it comes to the appraisal of the likelihood that a reactor will or will not be safe that you just about have to turn to the Atomic Energy Commission for expert advice on that subject. It is a difficult problem. I would only say, Doctor, when the Elk River reactor was studied by us on the committee to determine, (1) whether it was likely to be useful to the REA that was going to operate it, and (2) whether it would be safe for the people of Minnesota, we had to depend on the technical staff of the Atomic Energy Commission, and we will have to do that for a long time to come.

Thank you all very much. You have been very helpful to the committee, and to the Congress, when it considers this. This has been a very interesting session.

Chairman ANDERSON. Mr. Sandbank.

STATEMENT OF HAROLD SANDBANK, DIRECTOR, SPECIAL STUDY ON ATOMIC ENERGY, AMERICAN MUNICIPAL ASSOCIATION

Mr. SANDBANK. Thank you, Mr. Chairman. This statement deals with the key role of local communities in atomic energy development. In response to the request of your committee, it discusses local activities and problems as background for the committee's consideration of Federal, State, and local responsibilities in this field.

The observations in this statement are based on studies and investigations of the impact on local communities resulting from peaceful applications of atomic energy, and particularly on a current study being made by the American Municipal Association under a contract with the Atomic Energy Commission.

In this study, we have been concerned with the following areas: (1) the extent of peaceful uses of nuclear materials (in order to provide perspective in considering the community impact); (2) effects on localities and local government functions; (3) programs of Federal, State, and local agencies and other groups active in this field; (4) standards and requirements controlling the use of nuclear materials; (5) sources of information and assistance available to communities and local officials.

SOME SPECIFIC OBSERVATIONS

We have examined various local problems and activities in the light of your committee's interest in scheduling these current hearings and accordingly make the following summary observations:

1. Peaceful uses of atomic energy have already reached substantial proportions and are having a definite impact on localities.

2. Local communities have a key role in both development and regulation of peaceful applications.

3. Local governments, as well as the States, are already active in the new atomic energy field, in line with their long-established responsibility to seek community benefits through industrial and economic development, and to provide protection for the public against potential hazards. Thus, they are already sharing responsibility with the Federal Government.

4. In the future, local communities will have an even greater share of responsibility. It will hardly be possible to expand peaceful applications and insure human safety without full collaboration and assistance of local government agencies that are closest to the point of impact.

5. If localities are to properly carry out their share of responsibility, they will need guidance and practical assistance of various kinds—financial as well as technical.

NOTE.—In emphasizing the key role of local communities we do not mean in any sense to minimize the importance of Federal or State activity, or the contributions of professional, industry, labor, and other groups. The Federal responsibility is paramount.

I would like to say this, that local communities are acting somewhat in the same manner as the State of New York in terms of approaching some of the regulatory aspects. It seems to me that they are taking this view. Perhaps it would be best to simply quote briefly from a publication issued by the State of New York. This publication, Atomic Energy For Small Business makes the following statement:

> Before a business or laboratory is allowed to use radioisotopes in its work, the New York State Department of Labor or Health must be satisfied that the personnel handling the isotopes are capable of doing so in safety.

Then it goes on to state that, "If the material to be used is licensed by the Atomic Energy Commission," then they must also get the approval of the Atomic Energy Commission. In other words, they take for granted that they have a primary responsibility toward the health and safety of their people, and that they are going to exercise this. The observation I would wish to make is that many local communities are taking exactly the same viewpoint, that they have a basic responsibility and are going ahead in this.

APPLICATIONS ALREADY SUBSTANTIAL

The available facts and figures on nuclear development show that peaceful applications are already substantial and are increasing. In addition to reactors of various kinds there are over 6,000 licensed users of nuclear materials. Of these, 5,200 are licensed users of radioisotopes, located in some 1,500 cities and towns across the country. It is because of this impact that we are beginning to get community action in various fields.

For local communities this means new processes, new products and new types of industrial and laboratory facilities. It also means new considerations in the operations of local government, in the responsibilities of local officials, and in the lives of local residents.

Some of the facts in the present situation are summarized in the attached table 1 and table 2. Table 3 shows the distribution of the 5,200 radioistope licensees.

I would like to point out, Mr. Chairman, that the localities are the first to get the impact. In fact, we do not have practical applications of atomic energy until we begin to get plants and nuclear processes operating in a particular locality. Until the local impact occurs, the whole thing is theoretical. What these things mean to localities are new plants, new kinds of industrial facilities, and these are the things that the local people must be concerned about.

As far as the future is concerned, locality impact is likely to increase because we can simply not conjecture that the vast effort that the Federal Government and our industry is putting into this field can have any other result than to increase the applications very substantially.

Our atomic energy program involves a national investment of over $20 billion at this stage. It has called upon the best scientific brains and our best technological skills. Through your committee recommendations and the acts of Congress, we are making national appropriations in the nature of several hundred million dollars a year. If we are to succeed in these efforts, the impact will inevitably be felt with force in our cities and towns where the new processes are used and the new installations are located, and where we live and work and bring up our children.

LOCALITIES CAN HELP OR HINDER DEVELOPMENT

Local communities can definitely influence the nature of nuclear development. They have a key role in two important areas: First, in providing a local atmosphere that is receptive to sound progress. Second, in assuring adequate safeguards for public protection against the hazards. These aspects are closely related and for the community they involve both benefits and problems.

There has already been enough experience to show that the attitudes and actions of local people can directly help or hinder peaceful development. You may be familiar with some of the examples:

A major well-established firm had planned to build a small research reactor in a community in one of the Eastern States. It had acquired the site, obtained AEC approval to go ahead, and had discussed the plans with various departments of the State government. However, the locality was not informed until application was made for a necessary local permit. The local officials had not been oriented; they did not understand the nature of the construction and consequently experienced some fears about the effects it might have on the business and safety of their community. They denied the permit. The result was a serious delay and considerable expense for the sponsor before the matter was cleared up.

Just the reverse happened in another city not far away. Here again it was the case of a research reactor. In this instance, discussions had been held from the beginning with local people. They knew the facts, were aware of the problems and gave their approval. The reactor is now under construction.

Consultation with local officials and public does not necessarily mean local agreement and approval of nuclear facilities in every instance. There have been cases in which localities definitely disapproved and have refused to go along. In one case the community went to the extent of passing a special local ordinance to prevent a nuclear waste disposal facility from operating within its jurisdiction.

On the positive side local officials and leaders can have a key role in creating real understanding in helping to remove needless fear about the effects of atomic energy. They are right at the point of impact. They have a responsibility to seek the economic benefits of atomic energy for their communities. They also have a direct responsibility for public health and safety by assuring adequate control of the radiation hazards.

When local leaders know the facts and understand the community preparations that are necessary, they are in a good position to give guidance to the local public and press as background for sound and safe development.

COMMUNITY BENEFITS

We hear much about the problems associated with atomic energy, and I will shortly comment on some of them that we have encountered. However, there are also specific benefits. I mention some here:

ISOTOPES

The medical applications of isotopes, for example, offer health benefits to local people.

Various city departments may be direct users of these materials. Health agencies are using them in medical research and therapy. Engineering departments are beginning to use them in structural inspections and sanitary engineering studies. (Sewage flow and waste treatment studies are being made in several communities.)

Radioisotopes may be used by both large and small firms in a community. They can:

Provide opportunity for establishing new "hometown" industries;

Permit existings firms to diversify or expand operations; and thus

Increase prospects for insuring more stable employment opportunities for local people.

These things have been discussed by a number of local officials. They want to learn more about these things on a practical basis, and they are proceeding to do so.

Reactors also offer community advantages. For example, they may:

Provide new sources of needed power for local industry and community requirements.

Serve as a magnet for industrial and commercial development.

Provide new sources of revenue.

Produce heat for industrial processes and for buildings within the community.

Make possible treatment of community wastes.

Result in cleaner cities and reduce air pollution problems.

Cities with municipally owned power systems have a special interest in nuclear reactors. Piqua, Ohio, has entered into a contract with the Atomic Energy Commission under the demonstration reactor program, and will construct a nuclear powerplant as part of the municipal system. This development is being observed with interest in other municipalities. The possibility that reactors of moderate size may be economically more feasible than had been anticipated, is of particular interest to smaller cities.

Chairman ANDERSON. We have a couple in our program this year of exactly what you are talking about. They found they were more economical and they got these applications in right away. I am happy you mentioned that.

Mr. SANDBANK. Yes. Incidentally, as soon as the news got around about the drect conversion of nuclear energy into power, the development at Los Alamos, and the news also about the development in Chicago that the boiling water reactor could perhaps produce more than they had anticipated, both of these things have stimulated definite local interest in the possibilities.

Chairman ANDERSON. I think the experiment at Los Alamos has a long way to go before it will have commercial practicability. I did have a chance to go through the plant at Chicago, and I think it already has enormous possibilities to supply this type of power, such as the little Vallecitos plant, and others.

Mr. SANDBANK. This is true. In line with your comment, what we need is some real effort to point out what are the real potentials in this field in terms of timetables as well as crystal ball gazing. We need guidance from the Federal Government on this. There is no sense wasting local effort in such an important field.

LOCAL PROBLEMS

The expanding peaceful uses of atomic energy are creating specific problems and questions in connection with local building codes, zoning regulations, inspection procedures, health and safety services, monitoring, and pollution controls.

They are also causing changes in the responsibilities of local officials, mayors and city council members, as well as the personnel of various departments, health, fire, police, water, zoning, building, and others. Here are some examples of the questions now being faced locally:

Health services

Do industrial hygiene services need expansion? Should there be regular inspections to check on inplant radiation levels and safety procedures? Who should conduct the inspections? What records should the community maintain? What medical treatment should be available locally to those exposed to radiation? Should local monitoring procedures be instituted? Under what conditions?

Building regulations

Should they be suspended or revised in connection with atomic energy installations? Should codes be amended to cover standards for such facilities? What recognized standards and codes are now available for this purpose? Should local officials do any inspecting on construction of nuclear facilities?

Police and fire services

What training do departmental personnel need in dealing with emergencies in nuclear installations? What special equipment and protective clothing is required? How much will it cost?

Zoning and land use

Are changes needed in existing regulations to control different types of nuclear facilities? Should protective buffer areas be provided in certain cases? Would it be desirable to establish nuclear parks in some instances or should they be avoided?

These are just a few of the problems now being encountered, which affect the operations of local government. We find that health officials, for example, must appraise their industrial hygiene activity to take into account the new kinds of inspections that are needed in plants using radioactive materials. If they are fortunate, they will have on their staff personnel with a knowledge of radiation. If they are less fortunate —which is the usual case—they must consider how to get new qualified personnel, or how to train existing personnel. If substantial amounts of radioactive materials are used, it may be necessary to expand health programs to include environmental monitoring for levels of radioactivity. This requires new kinds of monitoring equipment, and it means that personnel must be trained in its use.

The fire department also must know exactly where all radioactive materials are used. Departmental personnel should be trained so that they will know the new techniques for handling fires in which such materials are involved, in order to protect themselves and the public against unnecessary radiation exposure. Special detection equipment and protective clothing may be required.

I note from the schedule that you are planning to have Lieutenant English of the Cleveland Fire Department on tomorrow or the next

day, and I am sure he will give you some examples that fire department personnel have encountered.

Other local department are also affected in various ways. Specific steps are being taken by localities to meet the increasing problems.

In Houston, Cincinnati, and a number of other cities, municipal health inspectors are now making inspections and surveys of installations having radiation sources, including those licensed by AEC. Philadelphia is endeavoring to provide training in radiation protection work to some of its environmental health staff, so that it can increase its activity in this field.

Fire department personnel in New York, Cleveland, and other cities are receiving training in radiation fire hazards. Selected instructors have taken the course for fire fighters provided by AEC. Additional training is being given locally by these instructors, and help is being provided by available health department and other specialists. The departments simply cannot afford to have their men go to a fire involving radioactive materials without being adequately prepared to handle these situations. The health and fire departments of a number of cities are cooperating in developing programs in the matter of equipment clothing, monitoring and coordinating their efforts with the civil defense activities.

Large cities and small ones are now making specific references to radiation and nuclear materials in zoning ordinances. The proposed new zoning code for New York City contains numerous and specific limitations on the use of radiation in various zoning districts. The zoning ordinances for Muttontown, Long Island, also contain specific limitations on use of radiation sources.

Water departments in several cities are now planning for the monitoring of local water supplies for levels of radioactivity. In Philadelphia, for example, the water department and health department are jointly working out plans for such monitoring. The necessary equipment is being installed by the water department, which will provide monitoring results to the health officials.

Sewer departments are becoming alerted to the discharge of radioactive wastes into sewer systems. Some cities (Ann Arbor and San Francisco, for example) have specific regulations on disposal of radioactive wastes. Los Angeles has been studying the possibility of using radioactive isotopes to trace sewage flow.

A number of cities have established a local registry of radiation sources. Some operate under a statewide registration law. Others such as Orlando and Ann Arbor have their own ordinances. Cleveland and Milwaukee have plans to require registration by local ordinance if their State legislatures do not enact statewide mandatory legislation at their current sessions.

Many cities have set up advisory committees, not only of officials, but of professional groups of the technical schools in the area, from industry, and so on. These committees are very helpful in organizing local programs.

SOME SPECIAL CONSIDERATIONS

These things relate to the brief summary that I made on page 1 of my statement, but I would like to emphasize several points.

Local communities must be able to handle the day-to-day problems connected with living and working with the atom. This means both

reactors and isotopes. The isotopes are not a small problem. People work with these things every day and they are becoming increasingly important in the thinking of local people. The local people must also be prepared to deal with the emergencies that may arise. Local officials and community leaders have a big job to do in order to:

Get the facts.
Understand the problems and benefits.
Prepare local departments for their new responsibilities.
Help overcome unfounded fear.
Assure adequate safeguards.

We find among other specific areas such things as this:

1. Local officials must be kept up to date on the amount and types of atomic energy facilities in the community: At present, although the locality is the first to get the impact, it is often the last to know about it. The procedure for handling notices of atomic energy licenses accounts for part of this. The AEC sends license notices to the State. However, the localities are not always notified promptly by the States. In some cases there is a time lag of a month or more before local people get to know. Delay can be dangerous. This is not only the view of local people, but also of some of the industrial people.

In Cleveland, for instance, I found several of the industry people saying they insist upon letting the local fire and health people know in order to prevent any possibility of a serious accident happening and catching the community unaware.

It should be possible to give prompt notice to localities. If the States cannot do this rapidly, the AEC could send a copy of the notice directly to the local community. Some cities have also stated that they only get partial information when they need complete information on their programs. I am referring now to the way in which the States send out the information. This is not a complaint against the States, but it simply is a reporting of a problem and a reporting of the facts.

Registration is being resorted to by some local communities in a number of instances in order that they can get the facts that they need about uses of radioactive materials.

2. Training is also a critical factor in local programs: Prompt efforts should be made to build up a reservoir of health and engineering personnel with a background of radiation use and protection. This is a long-range objective but meanwhile special programs are needed to provide existing personnel with special training. The Federal Government here should quickly provide assistance and financial support for such efforts.

The present efforts of the AEC, the Public Health Service, and others should be expanded as rapidly as possible so that we can get this assistance to the localities.

3. Standards and model codes are urgently needed: The Federal activity and research in this area should push ahead unabated. The National Committee on Radiation Protection and other groups should be encouraged to accelerate their efforts and if additional staff or funds are needed, these should somehow be provided.

I would like to emphasize this really is a very important point. We do need to push ahead on this. Among the other areas that we are having problems are standards on waste, transportation, exposure, and even on such things as labeling. We have found that confusion

does exist because ICC labels call things class D poisons when they are actually radioactive materials. The information is on the label, but people do not always read the entire label. This is one of the situations. How extensive this is we do not know. We do need this work on standards and model codes pushed ahead so that communities will have guides not only on what to do but also on what to avoid doing.

4. Local communities should have direct access to Federal agencies for technical assistance and financial aid when necessary, especially in those cases where State programs are not sufficiently developed to adequately serve local requirements: This point is emphasized because in some cases the established procedure is that local communities come to Federal agencies through the States. Now if the States are not prepared to act in this area at this stage (and we know that not all the States are uniformly active in this field) there should not be any bar in any legislation or fund provisions that would keep the localities from getting direct Federal help in these urgent matters. This should include both technical and financial assistance as necessary.

5. There is now no major national program dealing with the overall implications of the locality impact of atomic energy development: We are tackling this thing on a piecemeal basis, doing pieces and parts in the localities, States, and even at the Federal level. There is some effort. The AEC is doing some. The Public Health Service is doing some, but there is no coordinated effort. The local effects of this new field of technology may be on a major scale influencing the economy and long-term development plans of localities, as well as creating changes in the immediate functions of local government.

In view of the impact that can already be observed, it is not too early to establish a comprehensive national program to deal with these matters on a continuing basis. Such a program could provide the guides, the consultation, and assistance that are needed. To neglect this aspect could be a disservice to communities and could hinder sound progress in this field.

Chairman ANDERSON. Mr. Sandbank, I want to say to you that I thought I had gone over the problem carefully. I thought I had learned a good deal about it, but I profited considerably by this statement. I appreciate it very much. I think it is something that we could easily have overlooked. Particularly, you said about sending out notices to notify the State and not notify the municipality. I think that might be all right if there is no particular municipality involved, but in an area like Cleveland, it would be absurd to notify the State and not notify the municipality.

Mr. SANDBANK. We realize, Senator, that this may cause some administrative complications and difficulties. What I said about the AEC not sending notices at present is not a criticism of the Atomic Energy Commission, but it does bring up the fact that we need information.

Chairman ANDERSON. You know if you run through a notice you can put in one more carbon copy and just mail that to the city sometimes.

Mr. SANDBANK. That had occurred to us.

Chairman ANDERSON. I don't say it is completely practical at all times, but at least it puts them on notice that something is going on. If they don't like it, they have a right to protest. I think you have given us a good paper, and I just wanted you to know I appreciate it.

Mr. SANDBANK. Thank you, Senator.

Chairman ANDERSON. Thank you. The committee will meet at 10 o'clock tomorrow morning.

(Following are tables submitted for the record by Mr. Sandbank:)

TABLE 1.—*Extent of peaceful uses, a partial tabulation*

Licensed users of radioisotopes	5,200
States having licensed isotope users, reactors, or both	50
Local communities in which licensed installations are located	1,500
Reactors in operation, construction, or planning stages	300
Firms commercially reprocessing and distributing isotopes	+100
Persons annually diagnosed or treated with isotopes	800,000
Estimated annual savings by industry through use of isotopes	$100,000,000

TABLE 2.—*Some specific applications*

Peaceful applications of atomic energy are now being made in many fields. Among them are the following:

Rubber	Petroleum
Paper	Tobacco
Plastics	Instruments
Steel	Chemical
Food preservation	Drugs
Construction	Medical diagnosis
Electric power	Medical treatment
Transportation	Agriculture

TABLE 3.—*Number of cities in which radioisotope licensees are located in the various States*

	Cities	Licensees		Cities	Licensees
Alabama	21	73	New York	118	659
Alaska	4	8	North Carolina	28	86
Arizona	3	16	North Dakota	4	12
Arkansas	12	36	Ohio	65	246
California	122	500	Oklahoma	13	70
Colorado	14	86	Oregon	10	47
Connecticut	30	96	Pennsylvania	112	347
Delaware	7	22	Rhode Island	9	29
Florida	31	95	South Carolina	12	24
Georgia	18	68	South Dakota	10	24
Idaho	4	9	Tennessee	21	87
Illinois	66	297	Texas	65	316
Indiana	36	102	Utah	7	36
Iowa	31	72	Vermont	4	8
Kansas	13	48	Virginia	37	93
Kentucky	13	44	Washington	19	65
Louisiana	19	72	West Virginia	17	38
Maine	19	30	Wisconsin	27	127
Maryland	26	131	Wyoming	6	16
Massachusetts	78	169	Washington, D.C	1	75
Michigan	59	194	Canton Island	1	2
Minnesota	63	163	Guam	1	2
Mississippi	10	17	Hawaii	7	38
Missouri	21	121	Panama		
Montana	8	15	Puerto Rico	6	15
Nebraska	6	31	Canada	1	1
Nevada	3	8	Wake	1	2
New Hampshire	11	23			
New Jersey	97	227	Total	1,472	5,263
New Mexico	25	25			

NOTE.—This table shows the distribution only for radioisotope licenses. It does not include reactors or licenses issued for source and special nuclear materials.

(Thereupon, at 4:25 p.m., Wednesday, May 20, 1959, a recess was taken until Thursday, May 21, 1959, at 10 a.m.)

FEDERAL-STATE RELATIONSHIPS IN THE ATOMIC ENERGY FIELD

THURSDAY, MAY 21, 1959

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D.C.

The committee met, pursuant to recess, at 10 a.m., in room P–63, the Capitol, Representative Carl T. Durham presiding.

Present: Senators Anderson, Aiken, and Dworshak, Representatives Durham, Van Zandt, Price, Aspinall, Bates, and Westland.

Also present: James T. Ramey, executive director; David R. Toll, staff counsel; and George E. Brown, Jr., professional staff member, Joint Committee on Atomic Energy.

Representative DURHAM. The committee will come to order.

The Joint Committee on Atomic Energy is meeting this morning to continue its public hearings on Federal-State relationships.

For the last 2 days, we have received background information from representatives of Federal, State, and local agencies as to present activities at all levels of government in the atomic energy field.

This morning we are scheduled to hear from Commissioner Graham and other AEC representatives to explain the provisions of the bill proposed by AEC with respect to cooperation with States. This bill was introduced by myself (by request) as H.R. 7214, on May 18, 1959, and by Senator Anderson (by request) as S. 1987, on May 19, 1959.

We are pleased to have you with us this morning, Mr. Graham and Mr. Lowenstein. Please proceed.

STATEMENT OF JOHN S. GRAHAM, COMMISSIONER, ACCOMPANIED BY ROBERT LOWENSTEIN, OFFICE OF GENERAL COUNSEL, U.S. ATOMIC ENERGY COMMISSION

Mr. GRAHAM. Thank you, Mr. Chairman. I will read from a prepared statement which has been submitted to the committee, and on the first page may I ask you to correct your copy in the second line where it states "May 19, 1955"; that should be "1959." I will now begin, sir.

In my initial statement to this committee on Tuesday, May 19, 1959, I stated that:

By 1954 it was apparent that the time had arrived to modify the Atomic Energy Act in order to permit independent uses of atomic energy in a manner consistent with our national traditions and policies in other fields. So, too, it now appears that the time has arrived to consider the extent to which the responsibilities of our Federal and State governments for controlling radiation hazards from peaceful uses of atomic energy should be readjusted in a manner consistent with our national traditions and policies in other fields.

From the information which has been presented to the committee since these hearings opened Tuesday morning, it is apparent that since 1954 there has been a tremendous growth in the interest and activity of State agencies in the entire radiation field.

A number of States have ambitious programs for controlling radiation hazards and some of them are approaching the stage where, with further assistance and encouragement from the Federal Government, they can soon be ready to assume independent regulatory responsibilities for some of the sources of radiation presently regulated by the Commission.

One cannot judge the significance of the questions under consideration by the committee merely by reference to the proportion of States which are developing comprehensive radiation control programs, because most Commission licensees are concentrated in relatively few States. For example, about 55 percent of Commission byproduct material licensees are in eight States.

Mr. TOLL. Could you list those eight States or supply that for the record?

Mr. GRAHAM. Mr. Toll, I think we listed them on Tuesday, but if we did not, we will certainly supply them for the record. With your permission I shall read them to you now, sir.

Mr. TOLL. Thank you.

Mr. GRAHAM. The eight States are New York, California, Pennsylvania, Illinois, Texas, Ohio, New Jersey, and Minnesota.

Mr. TOLL. Of those, I believe New York, California, and Texas have comprehensive radiation regulations. Perhaps Pennsylvania and Illinois also. I am not sure. Do you know?

Mr. GRAHAM. Mr. Toll, we would have to check that and supply it for the record, if that is agreeable.

Representative DURHAM. I believe that would be useful for the record, if you would supply it.

Mr. GRAHAM. Yes, sir.

(The information referred to follows:)

STATES HAVING COMPREHENSIVE RADIATION PROTECTION REGULATIONS (AS OF MAY 1, 1959)

California, Connecticut, Massachusetts, Minnesota, Michigan, New York, Pennsylvania, and Texas.

Mr. GRAHAM. In our testimony today, we should like to identify some of the reasons why we believe it desirable to provide for a readjustment of Federal-State responsibilities in the atomic energy field; and why we believe it is desirable to adopt legislation on this subject as soon as may be practicable. We should also like to discuss the proposed bill which we have recommended to you.

First, however, I should like to refer to another subject which has received some attention in these hearings; namely, the questions as to whether and how responsibilities for radiation protection should be reallocated among agencies of the Federal Government. These are important questions and are deserving of serious consideration. As the committee knows, they are presently under study by the Bureau of the Budget, the Department of Health, Education, and Welfare, and the Atomic Energy Commission. We believe, however, that the question of reallocating responsibilities as between the Federal

and State Governments can proceed independently of questions pertaining to reallocation of responsibilities among agencies at the Federal level; and that legislation such as we have proposed might be adopted without prejudice to subsequent readjustments at the Federal level.

Under our Federal system of government, questions as to the proper division of responsibility between our Federal and State Governments constantly arise, as in the fields of taxation, labor relations, roads, and practically any other field in which our governments become involved.

It has been our national tradition, particularly with respect to health and safety, that State and local governments should bear the primary responsibility in the absence of considerations requiring or justifying Federal activity. This tradition has developed out of the practical experience of our history. We believe that radiation safety responsibilities in the atomic energy field should, insofar as possible, be allocated in the light of that experience.

The policy of decentralization in health matters is particularly compelling as regards atomic energy. The health and safety responsibilities of our State governments cover widely diversified kinds of risks in practically every field of activity—fire protection, electrical building codes, water and air pollution, safety of places of employment, the sanitation of food and water supplies, to mention only a few. The responsibilities of the State also include protection against radiation hazards from sources other than the materials regulated by the Commission. In dealing with these, and the many other matters affecting health which are under their control, many States have developed organizations, personnel, and techniques which in time and with suitable and adequate training could be utilized effectively and economically for controlling atomic energy hazards.

The States presently have the responsibility for controlling radiation hazards from sources of radiation outside the Commission's jurisdiction, such as X-rays and radium. Viewed solely in terms of numbers, the number of radiation sources outside the Commission's jurisdiction far exceeds the number of sources licensed by the Commission. Assumption by any State which has a comprehensive program for controlling sources outside the Commission's jurisdiction, of the additional responsibility of controlling sources presently regulated by the Commission should involve only a modest increase in personnel and budget requirements.

It would be desirable to enact legislation to clarify the role of the States at an early date. Most States are now uncertain as to the direction in which their programs should be developed and the extent to which funds and manpower should be committed to them. In their growing programs for controlling radiation hazards from these sources, the States will gain considerable experience and skill which can be applied to some of the sources presently under Commission jurisdiction. They will hesitate, however, to assign and train personnel and to commit funds to the development of programs for controlling radiation hazards from atomic energy activities until Federal policy has been clarified by the enactment of legislation.

Illustrative of the need for legislation at an early date are the recommendations of the Joint Federal-State Action Committee appointed by the Governors of the 48 States and the President; and the

concurrent resolution adopted in January 1959 by the South Carolina Legislature. Both of these are included in the Joint Committee print on this subject published in March of this year.

A previous bill was proposed in June 1957 by the Commission which was designed to define its authority to deal with the States in areas in which the Commission has regulatory functions; and to define the authority of the States to regulate areas of radiation protection in which the Commission has regulatory responsibilities. That bill would have authorized the States to exercise concurrent jurisdiction with that of the Commission. In an attempt to minimize the possibility of inconsistency between Federal and State requirements, the 1957 bill provided that the States should not exercise licensing responsibilities concerning activities for which a Commission license is required; and that State requirements may not be "in conflict with" those adopted by the Commission.

Since June 1957 there has been extensive discussion and consideration of the problem of Federal-State relationships in the atomic energy field, and considerable public discussion and analysis of the Commission's 1957 bill. The Commission has participated in many of those discussions and has thoroughly reexamined the entire problem. In particular, we have decided that it would be undesirable to provide for the exercise of dual or concurrent jurisdiction.

The result of our studies is represented by the bill which we sent to the Joint Committee on May 13, 1959, and which was introduced by Mr. Durham, H.R. 7214.

In January 1956 Congressman Durham introduced a bill to provide for a readjustment of Federal-State responsibilities in the atomic energy field (H.R. 8676, 84th Cong., 2d sess.); and a bill on the same subject was introduced by Senator Anderson in January 1957 (S. 53, 85th Cong., 1st sess.). Although there are some differences, and the provisions of our proposed bill are more detailed, our proposed bill adopts the basic approach to this problem which was incorporated by Senator Anderson and Congressman Durham in their bills.

We have been advised by the Bureau of the Budget that enactment of legislation along the lines of this bill would be in accord with the program of the President.

The new bill provides a statutory framework within which the States may assume an independent regulatory role in extensive areas now occupied by the Atomic Energy Commission on a basis which will assure appropriate protection for public health and safety and compatibility between the regulatory programs of the States and those of the Commission.

The activities presently regulated by the Commission include on one hand, persons engaged in research or medical activities who possess only minimal quantities of radioisotopes, natural uranium, or special nuclear material, and in most such cases radiation control is relatively simple and easy. At the other extreme our licensees include owners of nuclear reactors and, in time, will also include chemical reprocessors of irradiated nuclear fuels. Such activities involve large quantities of intensively radioactive materials and the necessary control measures are very complex and elaborate. Our objective in framing this bill was to designate which of these activities are within the early capabilities of the States, and to provide in the bill appropriate pro-

cedures and criteria on the basis of which regulatory responsibility for these areas can be turned over to the States as they become ready.

Under the proposed bill the Federal Government would retain responsibility for areas in which the technical safety considerations are of such complexity that it is not likely that any State would be prepared to deal with them during the foreseeable future. There would also be reserved for continued Federal responsibility areas as to which interstate, national, or international considerations seem to be paramount. These reserved areas include the construction and operation of nuclear reactors, together with related transportation and handling of nuclear fuel and disposal of reactor wastes, and the use of special nuclear material in quantities which are sufficient to form a critical mass. The bill would also provide for continued Federal control over radioactive disposal of materials into the oceans and such other disposal of other radioactive materials (such as high-level radioactive waste) as warrants continued Federal control because of the radiation hazards involved.

The areas which the Commission might "turn over" to the States include use of radioisotopes (byproduct material); natural uranium and thorium (source material); and small quantities of special nuclear material, i.e., those which are not sufficient to form a critical mass. We believe that control of radiation hazards from activities within these areas is well within the potential capabilities of the States; and that, with appropriate encouragement and support, most, if not all, of the States will in time be in a position to control radiation hazards from such activities.

Mr. TOLL. Mr. Graham, would you say that those types of sources are similar to other radiation sources such as X-ray machines which the States are already regulating?

Mr. GRAHAM. There are certain kinds of wastes, perhaps depleted uranium and low level wastes, if you can think about it in those terms, which are within the general radiation levels that the States are already controlling.

Representative DURHAM. Under the legislation under consideration here, would it give you the authority to designate to the States certain areas by regulation from the Commission? That is, you take this part of the job and we will do the other? I think we have to get concrete about this matter. For example, that the Commission will turn over to the States this, period. You take care of this hazard, and we will take care of the rest. Is that your idea of the authority contained in the bill?

Mr. GRAHAM. I have in mind two illustrations. Reactors, for example, would remain under Federal control, because of the potential hazards which might arise in the event of a serious accident.

Representative DURHAM. I think the States are going to have to know their responsibility. Are you going to turn over the policing, we might say, of the radiation hazards from radioisotopes, all of them or part of them? How are you going to do that? Are you going to do it by regulation or do you do it by regulation under the authority contained in this bill?

Mr. GRAHAM. The use of radioisotopes, sir, was the other extreme we have in mind as being something well within the capabilities of the States. Where radioisotopes are used by the physicians and hospitals, this is something which the States, in our judgment, are com-

petent to handle. They have already handled it. It is a historic matter. This is certainly the main area of present activity which we would like to turn over to them.

Representative DURHAM. Will that have to be done by agreement or would it be done by simply saying this is your responsibility, period?

Mr. GRAHAM. I think we do not want to walk away, if I can use that term, and expose the public health and safety unduly in the sense of being too fast. It is certainly something which you would have to do in cooperation with the States. By way of illustration, if this bill were enacted right away, you could not do it immediately.

Representative DURHAM. Would you require agreement from the States as to their participation?

Mr. GRAHAM. Sir, it was our idea that this would be worked out with the States and turned over under an agreement with the Governor of the State. You would not just do this unilaterally.

Representative DURHAM. This measure does give you authority to do that, in your opinion? We are enacting a law here.

Mr. GRAHAM. If you enact this law, in our opinion it would give us the authority to enter into agreements with the States to take over these areas.

Representative DURHAM. If the bill passes, of course, it becomes the law of the land. I think we should pretty clearly define the responsibilities at the Federal level and the State responsibilities. I don't see why we can't do that.

Mr. GRAHAM. This is what we would like to do, sir. We think this bill will permit us to do that.

Representative DURHAM. If you have the authority under the bill to do that, you can work it out either by agreement or by regulation. You are still the responsible agency when you produce radioisotopes. It does not matter where you put them. Your responsibility still extends to the radiation hazard from that product, in my opinion. I am not a legal expert, but we are the ones responsible for producing the hazard, and so I think our responsibility goes to the end of the road, and to say that this is the safe way to use it.

Mr. GRAHAM. Mr. Durham, I think when we get a little further along into the analysis of the bill, this will be made a little bit clearer.

Representative DURHAM. Very well. You may proceed. I raised the question only because you defined certain areas in which you expect to work.

Mr. GRAHAM. Yes, sir.

The specification of areas which might be turned over to the States should not be regarded as the ultimate dispositon of responsibility.

Representative DURHAM. That is just the point that I raised. Where does our responsibility begin and where does it end?

Mr. GRAHAM. I think we will have some specific illustrations for you, sir. With experience under this bill, and as the capabilities of the State develop, it may become desirable to consider further legislation to authorize turning over additional areas of responsibilities to States which are ready to assume them.

With your permission, I should like to offer for the record a copy of the letter from the Commission to the Joint Committee on Atomic Energy, forwarding the bill and a section by section analysis of the bill.

(The document referred to follows:)

ATOMIC ENERGY COMMISSION,
Washington, D.C., May 13, 1959.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States,
Washington, D.C.

DEAR SENATOR ANDERSON: On March 5, 1959, the Atomic Energy Commission forwarded a draft of proposed bill dealing with Federal-State relations in the atomic energy field. In a letter of that date the Commission advised the Joint Committee on Atomic Energy that the proposed bill was being forwarded before the Commission had completed its study of certain features of the bill and before receiving the views and advice of other Federal agencies. The Commission advised also that it might submit recommendations for modification of the draft bill at a later date.

The principal differences between the proposed bill attached to this letter (attachment I) and that forwarded to the committee on March 5, 1959, are the addition of subsections (a) and (k) and the revision of the provision which presently appears as the last sentence of subsection (b). A number of changes in phraseology have also been made, principally for purposes of clarification.

The proposed bill which is annexed incorporates a desirable approach to the question of adjusting the responsibilities of the Federal and State Governments with respect to the control of radiation hazards from atomic energy materials presently regulated by the Commission. The proposed bill is consistent with the recommendations of the President in his budget message for fiscal year 1960 and with the recommendations of the Joint Federal-State Action Committee to the President of the United States and to the chairman of the Governors' conference. The Bureau of the Budget has advised that enactment of legislation along the lines of this bill would be in accord with the program of the President.

On June 21, 1957, the Commission submitted to the chairman of the Joint Committee on Atomic Energy a proposed amendment to the Atomic Energy Act of 1954 designed to clarify the Commission's authority to deal with the States in areas in which the Commission has regulatory functions; and to define the authority of the States to regulate areas of radiation protection regarding which Congress has delegated regulatory responsibilities to the Commission. That proposed bill is hereinafter referred to as the 1957 bill.

The 1957 bill contained three paragraphs. The first paragraph would expressly authorize the Commission to carry out cooperative programs with the States, including agreements with States under which they might perform inspections and provide other services to the Commission. It would also authorize the Commission to furnish employee training and other appropriate services to the States. This paragraph is carried over into the new proposed bill with only minor drafting changes. The third paragraph of the 1957 bill contained a direction to the Commission to "continually study, in consultation with the States, the desirability of recommending to Congress legislation which would further adjust Federal and State responsibilities in the radiation protection field." The new bill does not contain such a provision.

The second paragraph of the 1957 bill contained the principal substantive provisions of the bill. Under this paragraph the Atomic Energy Act would be amended so that the States might adopt, inspect against, and enforce radiation standards for the protection of health and safety in areas regulated by AEC. Thus the bill, subject to certain qualifications, would permit dual regulation by both Federal and State Governments of activities involving source, special nuclear, and byproduct material and production and utilization facilities for protection against radiation hazards.

It should be noted that the 1957 bill would merely authorize State regulation in addition to AEC regulation. It would not permit the Commission to withdraw from any of its regulatory responsibilities even in States having very good radiation regulatory programs.

It was recognized by the Commission at the time the 1957 bill was submitted to the JCAE that the concept of dual jurisdiction did not represent more than an interim solution to the problem of adjusting Federal and State responsibilities in the atomic energy field. In the letter of June 21, 1957, to Congressman Durham forwarding the 1957 bill, the Commission stated:

"The Commission does not feel that this proposed amendment should be regarded as the ultimate disposition of State and Federal responsibilities for the protection of the health and safety of the public in the field of radiation protection with regard to the processing and utilization of source, byproduct, and

special nuclear material. The Commission proposes to continue to study this matter to determine whether it should propose legislation which would permit it to withdraw from some limited portions of its current regulatory jurisdiction for the radiation protection of the health and safety of the public. Such a study must consider, among other things, whether there is a continuing need for Federal control of radiation sources in order to keep the national radiation exposure level within the permissible limits in consideration of the long-range effects of radiation, and must also consider the respective abilities of the States and Federal Government to best perform functions of radiation protection in the various fields covered by the act The Commission feels that it is premature at this time to turn over to the States sole regulatory responsibility for any of the areas in the field covered by the 1954 act. However, the Commission recognizes that as knowledge in nuclear energy develops and becomes more widespread, and as we learn more about the hazards in this field, the States will undoubtedly gain a greater degree of competence through added technical resources, including technical personnel, laboratory facilities, and training programs. It should be pointed out that competence of the States to deal with radiation protection is not the sole criteria for deciding the scope of the responsibility that should be vested in them. Perhaps a more basic question is the extent to which Federal control must be exercised in the field of radiation health and safety in view of the national and international problems of atomic energy."

The proposed new bill (attachment I) represents, in the view of the Commission, a more definitive approach to the problem of adjusting Federal-State relations in the atomic energy field. It provides a statutory framework within which the States may assume an independent regulatory role in extensive areas now occupied by the Atomic Energy Commission on a basis which will assure appropriate protection for public health and safety and continued compatibility of the regulatory programs of the States and the Atomic Energy Commission.

Essentially, the objectives of this proposed bill (hereinafter referred to as the "new bill") are to provide procedures and criteria whereby the Commission may turn over to individual States, as they become ready, certain defined areas of regulatory jurisdiction. Certain areas, as to which interstate, national, or international considerations may be paramount, would be excluded. In addition, certain areas would be excluded because the technical safety considerations are of such complexity that it is not likely that any State would be prepared to deal with them during the foreseeable future.

To assist the States to prepare themselves for assuming independent regulatory jurisdiction, the new bill (like the 1957 bill) specifically authorizes the Commission to provide training and other services to State officials and employees and to enter into agreements with the States under which the latter may perform inspections and other functions cooperatively with the Commission.

The bill includes criteria which would need to be met before the Commission could turn over any of its responsibilities to a State; and provisions pursuant to which the Commission might reassert its authority. The bill provides that the Commission may, upon request of the Governor or upon its own initiative, terminate or suspend its agreement with the State and reassert its regulatory authority if the Commission finds that such termination or suspension is required to protect public health and safety. Opportunity for hearing is provided.

The bill also contains specific provisions designed to remove doubt as to the relative responsibilities of the Commission and the States. These provisions are contained in the first sentence of subsection (b) (1) and in subsection (j).

The proposed bill does not affect the jurisdiction of other Federal regulatory agencies. It provides only for discontinuance of the exercise of Commission jurisdiction, after agreement with the Governor of a State. The jurisdiction of such agencies as the Interstate Commerce Commission, the Civil Aeronautics Board, Department of Health, Education, and Welfare, Federal Trade Commission, and other Federal regulatory agencies will not be affected.

Attachment II is a detailed section-by-section analysis of the proposed bill.

Sincerely yours,

A. R. LUEDECKE, *General Manager.*

ATTACHMENT I

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That—

SECTION 1. The following section be added to the Atomic Energy Act of 1954, as amended:

"SEC. 272. COOPERATION WITH STATES.—

"(a) It is the purpose of this section—

"(1) To recognize the interests of the States in the peaceful uses of atomic energy, including but not limited to radiation hazards regulated by the Commission under this Act;

"(2) To recognize the need, and establishment programs, for cooperation between the States and the Federal Government with respect to control of radiation hazards;

"(3) To promote an orderly regulatory patter among Federal and State Governments respecting radiation hazards and nuclear development and use;

"(4) To establish procedures and criteria for discontinuance of certain of the Commission's regulatory responsibilities, and the assumption thereof by the States.

"(b) (1) Except as provided in paragraph (2) of this subsection, the Commission is authorized to enter into agreements with the Governor of any State providing for discontinuance of the regulatory and licensing authority of the Commission under chapters 6, 7, and 8, and section 161 with respect to any one or more of the following categories of activities within the State and, during the duration of such an agreement, nothing in this Act shall be construed to derogate from the authority of the State to regulate and license the categories of activities covered by the agreement for the protection of the public health and safety from radiation hazards:

"(i) The ownership, possession, use, transfer, delivery, receipt and disposal of byproduct material;

"(ii) The possession, use, transfer, delivery, receipt, and disposal of such quantities of special nuclear material as the Commission determines by regulation or order are not sufficient to form a critical mass;

(iii) The ownership, possession, use, transfer, delivery, receipt, and disposal of source material.

"(2) No agreement entered into pursuant to this subsection shall provide for discontinuance of any authority of the Commission with respect to—

"(i) Any activity under a license issued by the Commission for the construction or operation of a production or utilization facility;

"(ii) The export from or import into the United States of source, special nuclear or byproduct material or of any production or utilization facility;

"(iii) The disposal of byproduct, source or special nuclear waste material into the ocean or sea as defined in regulations or orders of the Commission;

"(iv) Such other disposal or byproduct, source or special nuclear waste material as the Commission determines by regulation or order should, because of the hazards or potential hazards thereof, not be so disposed of without a license from the Commission.

"Notwithstanding any agreement between the Commission and any State pursuant to this subsection (b), the Commission is authorized by rule, regulation, or order, to require that the manufacturer, processor, or producer of any equipment, device, commodity or other product containing source, byproduct, or special nuclear material shall not transfer possession or control of such product except pursuant to a license issued by the Commission.

"(c) No agreement entered into under subsection (b), and no exemption granted pursuant to subsection (f), shall affect the authority of the Commission under subsection 161 (b) or (i) to issue rules, regulations, or orders to protect the common defense and security, to protect restricted data or to guard against the loss or diversion of special nuclear material. For purposes of subsection 161(i), activities covered by exemptions granted pursuant to subsection (f) shall be deemed to constitute activities authorized pursuant to this Act; and special nuclear material acquired by any person pursuant to such an exemption shall be deemed to have been acquired pursuant to section 53.

"(d) The Commission shall enter into an agreement under subsection (b) of this section with any State if—

"(1) the Governor of that State certifies and the Commission finds that the State has a program for the control of radiation hazards which is adequate to protect the public health and safety with respect to activities within the State covered by the proposed agreement; and

"(2) the Commission finds that the State program is not incompatible with the Commission's program for the control of radiation hazards.

"(e) (1) Before any agreement under subsection (b) is signed by the Commission, the terms of the proposed agreement and of proposed exemptions pursuant

to subsection (f) shall be published once each week for three consecutive weeks in the Federal Register; and such opportunity for comment by interested persons on the proposed agreement and exemptions shall be allowed as the Commission determines by regulation or order to be appropriate.

"(2) Each agreement shall include the date as of which the agreement and exemptions will become effective. The agreement and exemptions shall be published in the Federal Register within 30 days after signature of the agreement by the Commission and the Governor.

"(f) The Commission is authorized and directed, by regulation or order, to grant such exemptions from the licensing requirements contained in chapters 6, 7, and 8, and from its regulations applicable to licensees as the Commission finds necessary or appropriate to carry out any agreement entered into pursuant to subsection (b) of this section.

"(g) The Commission is authorized and directed to cooperate with the States in the formulation of standards for protection against hazards of radiation to assure that State and Commission programs for protection against hazards of radiation will, to the extent feasible, be coordinated and compatible.

"(h) The Commission in carrying out its licensing and regulatory responsibilities under this Act is authorized to enter into agreements with any State, or group of States, to perform inspections or other functions on a cooperative basis as the Commission deems appropriate. The Commission is also authorized to provide training, with or without charge, to employees of, and such other assistance to, any State or political subdivision thereof or group of States as the Commission deems appropriate.

"(i) The Commission, upon its own initiative after reasonable notice and opportunity for hearing to the State with which an agreement under subsection (a) has become effective, or upon request of the Governor of such State, may terminate or suspend its agreement with the State and reassert the licensing and regulatory authority vested in it under this Act, if the Commission finds that such termination or suspension is required to protect the public health and safety.

"(j) Nothing in this section shall be construed to affect the authority of any State or local agency to regulate activities for purposes other than protection against radiation hazards.

"(k) With respect to each application for Commission license authorizing an activity as to which the Commission's authority is continued pursuant to paragraph (2) of subsection (b), the Commission shall give prompt notice to the State or States in which the activity will be conducted of the filing of the license application; and shall afford reasonable opportunity for State representatives to offer evidence, interrogate witnesses, and advise the Commission as to the application without requiring such representatives to take a position for or against the granting of the application.

"(l) As used in this section, the term 'State' means any State, Territory, or possession of the United States, the Canal Zone, Puerto Rico, and the District of Columbia. 'Governor' means the chief executive officer of any State."

SEC. 2. Section 108 of the Atomic Energy Act of 1954 is amended by deleting the phrase "distributed under the provisions of subsection 53(a)," from the second sentence.

ATTACHMENT II

The following is an analysis of the proposed bill to amend the Atomic Energy Act of 1954.

Subsection (a) declares the purposes of the proposed bill. These include recognition of the interests of the States in peaceful uses of atomic energy; establishment of programs for cooperation between the States and the Federal Government regarding control of radiation hazards; promoting an orderly regulatory pattern between Federal and State Governments respecting radiation hazards and nuclear development and use; and establishment of procedures for discontinuance of certain of the Commission's regulatory responsibilities, and the assumption thereof by the States.

Subsection (b) authorizes the Commission to enter into an agreement with the Governor of any State to provide for discontinuance of the regulatory and licensing authority of the Commission under chapters 6, 7, and 8 and section 161 of the Atomic Energy Act of 1954, as amended, with respect to certain defined activities within the State. Except as excluded in paragraph (2) of the subsection, these activities are—

(i) The ownership, possession, use, transfer, delivery, receipt, and disposal of byproduct material;

(ii) The possession, use, transfer, delivery, receipt, and disposal of such quantities of special nuclear material as the Commission determines by regulation or order are not sufficient to form a critical mass;

(iii) The ownership, possession, use, transfer, delivery, receipt, and disposal of source material.

These areas encompass by far the greatest part of present Commission licensing and regulatory activities. They are areas which are susceptible of appropriate and adequate regulation by the States.

Three categories of activities are specified. Under the bill the Commission may enter into an agreement providing for discontinuance of its regulatory authority with respect to any one or more of these categories. Such an agreement may not provide for discontinuance of the Commission's authority with respect to part of a category. There may, however, be a series of agreements with a particular State adding additional categories as time goes on and the State program develops. It would be the intention of the Commission under this bill to enter into agreements with the States covering all of the categories as soon as the States are prepared to assume those responsibilities.

Quantities of special nuclear material which may present hazards of accidental criticality are excluded from the scope of the bill because of the difficult technical problems presented and because of the acute scarcity of experienced specialists in this field. As a consequence of the exclusion of such quantities, such activities as the processing of special nuclear material, fabrication of fuel elements and similar activities involving significant quantities of special nuclear material will remain subject to the licensing requirements and other regulatory controls of the Commission. As our store of knowledge concerning problems of criticality expands and the number of specialists in the field increases, it may become feasible by amendment of the section to include larger quantities of special nuclear material among the areas in which the Commission is authorized to discontinue its regulatory program.

The statement in paragraph (1) of the subsection that, "during the duration of such an agreement, nothing in this Act shall be construed to affect the authority of the State to regulate and license the categories of activities" covered by any agreement with the State is designed to make clear the intent that, upon discontinuance of the Commission's authority, the State shall have full jurisdiction with respect to regulation of those activities for protection against radiation hazards.

Paragraph (2) of subsection (b) defines those areas in which the Commission may not agree to discontinue its regulatory and licensing authority. These areas are—

(i) Any activity under a license issued by the Commission for the construction or operation of a production or utilization facility.

Such activities include, but are not limited to, the possession and storage at the site of the licensed activity of nuclear fuel and of source, special nuclear material and byproduct materials used or produced in the operation of the facility; the transportation of nuclear fuels to and from the reactor site; and the discharge of effluent from the facility.

(ii) The export from or import into the United States of source, special nuclear or byproduct material or of any production or utilization facility.

The reasons for excluding exports and imports from State regulatory jurisdiction are obvious. The control of exports and imports is a matter primarily of Federal rather than State interest. This exclusion applies only to the act of importation or exportation; and would not affect the authority of a State to regulate the possession or transfer of materials which are imported or exported.

(iii) The disposal of byproduct, source or special nuclear waste material into the ocean or sea as defined in regulations or orders of the Commission.

This exclusion is included because the ocean disposal of those materials will frequently involve the interests of a number of States and may also frequently involve international considerations.

The Commission is authorized in the exclusion to define by regulation or order what constitutes disposal of material into "the ocean or sea" because difficult problems of statutory construction might otherwise arise. Under this exclusion the Commission would be authorized to reserve for the continued exercise of Federal control the disposal of source, special nuclear, and byproduct material into such areas as the Gulf of Mexico and also, in appropriate cases, into harbors

or waterways under circumstances where disposal into the harbor or waterway may result in significant contamination of an ocean or sea.

(iv) Such other disposal of byproduct, source or special nuclear waste material as the Commission determines by regulation or order should, because of the hazards or potential hazards thereof, not be disposed of without a license from the Commission.

This provision gives the Commission authority, by regulation or order, to reserve for the continued exercise of Commission regulatory controls, such disposal of byproduct, source or special nuclear waste material other than into the ocean or sea as the Commission determines require the continued exercise of Commission regulatory controls because of the hazards or potential hazards of such disposal. It is anticipated, for example, that the Commission will reserve for the continued exercise of its regulatory controls, the disposal by burial of significant quantities or types of such materials. The disposal by burial of significant quantities of these materials may present unique and difficult problems requiring continued Federal control. Burial of fission products and other radioactive materials having a long life might require continued regulatory supervision for centuries or even millenia after burial. At the present time the Commission does not permit the disposal by burial of significant quantities of radioactive materials except on Commission-owned property.

Many States are developing good working relationships with neighboring States to provide for the joint control of pollution in waterways which are of mutual interest to them. It will be the policy of the Commission under this bill to encourage the States to extend these arrangements to the disposal of radioactive materials into rivers and other waterways or to enter into new arrangements for the protection of their common interests. Such arrangements could make it possible for the Commission to discontinue its regulatory controls in many States and regions over the disposal of radioactive materials into rivers and streams.

It should be noted that under paragraph (2)(i) the Commission will retain control over the disposal by licensed operators of production and utilization facilities (including reactors and chemical reprocessing plants) of radioactive wastes produced under licenses for the operation of production or utilization facilities.

The last sentence of subsection (b) provides that—

"Notwithstanding any agreement between the Commission and any State pursuant to this subsection (b), the Commission is authorized by rule, regulation, or order, to require that the manufacturer, processor, or producer of any equipment, device, commodity or other product containing source, byproduct, or special nuclear material shall not transfer possession or control of such product except pursuant to a license issued by the Commission."

This sentence does not detract from any authority which may be turned over to a State. The authority which might be exercised by the Commission under this provision would be in addition to any authority exercised by a State following an agreement under paragraph b(1).

The controls which would be exercised by the Commission under this provision would apply only to "transfer of possession or control" by the "manufacturer, processor, or producer." The Commission would not be authorized under this provision to regulate any radiation hazards which might arise during manufacture, transportation, or use of a product.

Under the provision, the Commission will be in a position to assure that articles containing byproduct, source, or special nuclear material will not be distributed unless they meet the Commission's minimum safety requirements, including appropriate manufacturing and processing specifications and labeling requirements. Manufacturers of such devices as gages, luminous markers, radiograph and teletherapy devices, electronic tubes, and so forth, sell their products throught the United States and in many foreign countries. It is important to assure that controls with respect to such products should be uniform and should be uniformly applied.

There is an additional reason why it is important for the Commission to continue the exercise of control over the distribution of articles containing source, byproduct, or special nuclear material. As the supply of such radioactive materials, particularly byproduct materials, increases, there may be increasing proposals by manufcturers and processors to incorporate such materials in articles (such as consumer products) that receive widespread distribution. Although it is not a present problem, the extent to which the widespread distribution of radioactive materials should be permitted in this country may in the foreseeable

future present questions of public policy which can be resolved, and the hazards controlled, only at the Federal level.

Subsection (c) is designed to make it clear that the bill does not affect the Commission's jurisdiction under the Atomic Energy Act of 1954, as amended, to issue appropriate rules, regulations, or orders to protect the common defense and security, to protect restricted data, or to guard against the loss or diversion of special nuclear material. Under the bill the Commission would have continued authority to issue rules and regulations for these purposes applicable to any user of source, byproduct or special nuclear material, even though the user might be exempt (pursuant to subsection (f)) from Commission licensing requirements and from Commission regulations designed to protect health and safety.

Subsection (d) specifies the findings which the Governor of the State and the Commission must make before the Commission can enter into an agreement with the State under the bill. The Governor must certify, and the Commission must find, that the State has a program for the control of radiation hazards which is adequate to protect the public health and safety with respect to activities within the State covered by the proposed agreement. The Commission must find that the State program is compatible with the Commission's program for the control of radiation hazards.

If this bill is enacted, the Commission would plan, in cooperation with the States and appropriate Federal agencies, to develop model State regulations and programs for assisting States to qualify under the bill.

Under the Atomic Energy Act of 1954 and regulations issued thereunder by the Commission, no person may acquire or possess, source, byproduct, or special nuclear material without first obtaining a license from the Commission. As a result of this licensing requirement, the Commission makes a preevaluation of the ability of a license applicant and the adequacy of the applicant's procedures and equipment, to assure that appropriate safeguards can and will be observed by the applicant. An adequate State program for control of radiation hazards may need to include appropriate preevaluation procedures applicable in some situations to assure that significant quantities of radioactive materials are not acquired by unqualified persons or organizations. This will require further study. Most State and local agencies which have issued radiation protection regulations have thus far only required the registration of the sources of radiation. It may be that in some States enabling legislation would need to be adopted before State agencies would have authority to adopt preevaluation procedures.

Subsection (e) specifies the public procedures which must be observed by the Commission before any agreement under subsection (b) may become effective. The procedures are self-explanatory.

Subsection (f) authorizes and directs the Commission, by regulation or order, to grant such exemptions from the licensing requirements contained in chapters 6, 7, and 8 of the act, and from its regulations applicable to licensees, as the Commission finds necessary or appropriate to carry out the provisions of any agreement entered into with a State under subsection (b). Subsection (f) gives the Commission necessary authority to implement those agreements.

Subsection (g) authorizes and directs the Commission to cooperate with the States in the formulation of standards for protection against hazards of radiation to assure that State and Commission programs for protection against hazards of radiation will be coordinated and compatible with each other. In order to achieve the orderly development and exploitation of uses of sources of radiation in industry, research, medicine, agriculture, and other fields, on a basis which will adequately protect the public health and safety, it is important that Federal and State radiation protection programs be coordinated; and that there be reasonable compatibility among the various Federal and State programs. Such cooperation will become even more important as the States assume independent regulatory responsibilities within areas presently occupied by the Atomic Energy Commission.

The first sentence of subsection (h) clarifies the Commission's existing authority under subsection 161(f) of the act. It would expressly authorize the Commission to enter into agreements with any State or group of States to perform inspections or other functions on a cooperative basis as the Commission deems appropriate, including such additional functions as assistance in evaluating the meteorological and hydrological conditions of sites proposed for nuclear activities, radiological surveys, and other appropriate services. The Commission has already made its intent clear to recognize where possible the

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functions of appropriate State agencies in the inspection of Commission licensees authorized to use byproduct and source material. This policy will assist States to prepare themselves to assume independent regulatory functions.

The second sentence of subsection (h) would authorize the Commission to provide training with or without charge to employees of any State (or political subdivision) and such other services as the Commission deems appropriate. The Commission already has general authority under section 31(b) to grant assistance for education and training in the fields specified in section 31(a). However, the Commission feels it is desirable in this bill to emphasize and clarify its authority to provide assistance in the training of State employees and to provide other services to the States without charge.

The training and other services furnished to the States under the second sentence of subsection (h) would be intended to assist the States to prepare for, and carry out, independent State radiation protection programs.

It is not our intention in connection with this training assistance to supplant the programs of other Federal agencies, such as the Department of Health, Education, and Welfare, which have existing authority much broader in scope. Rather, it is our intention to work closely with such agencies in correlating our training assistance with their programs and to use any training facilities or programs which they have established, to the extent that they are suitable to our purposes.

If this bill is adopted, the Commission will assist the States to qualify under the bill. In cooperation with the States, Federal agencies, other organizations such as the National Committee on Radiation Protection, the Council of State Governments, and the National Association of Attorneys General, the Commission would take appropriate steps to assure that appropriate model State regulations and legislation are prepared, and that adequate opportunities for training State employees are made available to the States. As noted above, the Commission will, as rapidly as qualified State personnel are available, enter into appropriate agreements with States to cooperate in performing inspection and other functions in connection with the Commission's regulatory program. Under the provisions of the proposed bill, the Commission will also be able to furnish States which have entered into agreements with the Commission with assistance in the form of consulting services and other specialized assistance.

Subsection (i) provides that the Commission may, upon its own initiative or upon the request of the Governor of a State with which an agreement under subsection (b) has become effective, terminate or suspend the agreement and reassert its licensing and regulatory authority. Before doing so, however, the Commission must find that such termination or suspension is required to protect public health and safety. If the termination or suspension is upon the Commission's initiative, notice and opportunity for hearing must be given to the Governor or other chief executive officer of the State.

Subsection (j) is designed to make it clear that nothing in this section is intended to affect the authority or regulations of any State or local agency to protect the health, safety and welfare of the public against hazards other than radiation hazards. This provision should remove whatever doubts may exist as to the authority of the States to regulate the activities of AEC licensees for purposes other than protection against radiation hazards.

Subsection (k) provides appropriate statutory recognition of the interest of the States in activities (defined in par. (2) of subsec. (b)) which are retained under Commission control. It assures that the States will be given appropriate notice of the filing of applications for licenses to conduct such activities; and appropriate opportunity to participate in proceedings involving such applications.

Subsection 1 contains a definition of "State" as used in the proposed bill in order to make it clear that the provisions of the bill apply also to territories and possessions of the United States, the Canal Zone, Puerto Rico, and the District of Columbia. Because the District of Columbia does not have a governor, "Governor" is defined as meaning the chief executive officer of any "State."

Section 2 of the proposed bill would also amend section 108 of the act by deleting "distributed under the provisions of subsection 53(a)," from the second sentence. The purpose of this amendment is to assure that the authority of the Atomic Energy Commission under section 108 will not be impaired by reason of the Commission's having entered into an agreement with the Governor of any State.

Mr. GRAHAM. I should like to have Mr. Robert Lowenstein of the Office of General Counsel present a more detailed discussion of the bill, and the attached analysis. It is at this point, sir, that I think some of the questions that you raised can be answered a little more specifically.

Representative DURHAM. Thank you very much, Mr. Graham. In the last paragraph you say it may become desirable to consider further legislation to authorize turning over additional responsibility to the States. Why would it require any additional legislation under a measure like this?

Mr. GRAHAM. I think what we were trying to say, sir, is that this is the first beginning, if this bill were enacted, to move into this area. Probably at some time in the future we would want to come back and ask for legislative authority to turn over other areas. We were merely saying that we are not trying to think of this as just a one-shot proposition. It is only a beginning and hopefully, as we go down the road and the States are better equipped to do this work, there probably would be other areas which they could take over.

Representative DURHAM. You are not restricted by any law now as to what you can turn over to the States, are you? It is a matter of what is your own considered judgment as to what is best not to turn over. Looking to the future, I think probably we will have to have legislation to put it in statutory form. But under the present setup, you can say to the State of New Mexico, "Here, you take over Los Alamos and do the job," if you determine that they have the personnel and everything to carry out safety measures. What prohibits you from doing that?

Mr. LOWENSTEIN. Mr. Durham, under the Atomic Energy Act, we are charged with the responsibility for controlling these hazards.

Representative DURHAM. Under the 1954 act.

Mr. LOWENSTEIN. Yes, sir. Under a great many Supreme Court decisions, and I think in light of the testimony that was furnished to the committee yesterday, there is a considerable view that under the act that, while the States may have some authority in areas of the Commission's regulatory responsibilities, there are undoubtedly some things the States do not have authority to do.

The purpose of this bill is to provide a legal basis on which with legislative approval the Commission would be given the authority, as to certain designated areas which the States have a potential capability for controlling, to turn these over to the States and our regulatory responsibility would cease at that time if the States were prepared.

Representative DURHAM. The 1954 act did provide that authority for the Commission to regulate.

Mr. LOWENSTEIN. That is right.

Representative DURHAM. In regard to hazards from radiation.

Mr. LOWENSTEIN. Now, what we are asking the Congress for is legislation to provide a mechanism for defining State responsibility and for the State to pick up some of this load.

Representative DURHAM. Do you think it is possible at the present time to define pretty definitely the areas, or would you just more or less take it piecemeal?

Mr. LOWENSTEIN. I would not call it a piecemeal approach. It defines the areas which the Commission now believes that most, if not all, States have a good potentiality for being able to control during the next several years.

It reserves for continued Commission control reactors and quantities of special nuclear materials sufficient to form a critical mass, because we now believe that the Federal interests in these two areas are such, and that the lack of trained people and the complexity of these areas are such, that right now we should not consider turning those over to the States. I think the import of Mr. Graham's remark in the last paragraph of his statement was that perhaps in time as the industry and the States' capabilities develop, perhaps then we could consider turning over some parts of those areas to the States, but not yet.

Representative DURHAM. We have been in this business now for about 20 years.

Mr. LOWENSTEIN. To show the significance of this, if I may furnish some additional statistics in addition to those that Mr. Graham gave you before, the areas that we could turn over to the States, assuming that all of them were ready and had trained people now, would include all our isotopes licenses.

Representative DURHAM. What I am getting at is that we in the Congress don't like to receive letters from people saying that certain materials are going into certain streams, and we don't know whose responsibility it is, whether it is AEC or the States. That is the point I am getting at. We ought to define these areas specifically so that I can write back and say that it is the responsibility of the Governor of the State or the AEC.

Mr. LOWENSTEIN. The assignment of definite responsibility is part of this bill, and that will emerge as we go through.

Representative DURHAM. Do you have a prepared statement?

Mr. LOWENSTEIN. I don't have a prepared statement. I thought I would run through the bill section by section in light of the analysis that we have furnished to you, and I would be prepared to answer any questions that you may have as we go through.

Representative DURHAM. Very well.

Mr. LOWENSTEIN. The first subsection (a) declares the purposes of this bill. They include recognition of the interests of the States in the peaceful uses of atomic energy, and establishment of programs for cooperation between the States and the Federal Government regarding control of radiation hazards; and here I might interpolate that this would give statutory recognition and encouragement for many existing programs for cooperation.

The purposes include also promoting an orderly regulatory pattern between Federal and State Governments respecting radiation hazards and nuclear development and use.

Finally, the establishment of procedures for discontinuance of certain of the Commission's regulatory responsibilities and the assumption of those by the States.

Subsection (b) contains the major substantive provisions of the bill. It authorizes the Commission to enter into an agreement with the Governor of any State to provide for discontinuance of the regulatory and licensing authority of the Commission under the licensing and regulatory provisions of the act, with respect to certain defined ac-

tivities within the State. There are some exceptions to these which we will come to. They are in the next paragraph. The regulatory responsibilities which we could turn over to the States are defined in paragraph (b)(1), line 22, at the bottom of page 2 of the House print of the bill—and include first the ownership, possession, use, transfer, delivery, receipt, and disposal of byproduct material. Second, possession, use, transfer, delivery, receipt, and disposal—these are words that are taken from the Atomic Energy Act of 1954—of such quantities of special nuclear material as the Commission determines by regulation or order are not sufficient to form a critical mass.

The third category is the ownership, possession, use, transfer, delivery, receipt, and disposal—these again are technical words from the statute—of source material.

To illustrate what some of these activities might be, Mr. Chairman, with respect to the first category of byproduct material, these are radioisotopes. They are used principally for medical purposes, for therapeutic and diagnostic purposes, in small quantities or in larger quantities in the form of sealed sources, such as the large cobalt 60 teletherapy units which the hospitals are using. In industry they are used for industrial radiography to determine the soundness of welds or structural materials. They are used on a wide scale by industry in thickness gages, and process procedures to control the thickness of papers and the quality of cigarettes. They are widely used also for research and development purposes.

Most of the special nuclear material in the quantities which we could turn over to the States are in the form of plutonium-beryllium sources that are used in subcritical assemblies as a source of neutrons by many of the universities that have acquired these facilities in their research and training programs.

As to source material, the major licensed activities include the mills and in addition there are a number of industrial and research uses of source material. Thorium is used in kerosene or oil lanterns in making the mantles. It also is used as an alloy for various kinds of structural metals. Uranium is industrially used as a coloring agent in ceramics. Of course, there are chemical uses of both thorium and uranium in the form of source material.

I don't want to stay too long with this, but a few figures might be helpful to illustrate how much of the Commission's regulatory activities fall within these three areas. As Mr. Graham mentioned, about 55 percent of our isotope licensees are in eight States. We have about 4,700 isotope licensees. Of the source material licensees——

Representative VAN ZANDT. May I interrupt to get a figure again?

Mr. LOWENSTEIN. Yes, sir. We have approximately 4,700 byproduct material licensees, 55 percent of these being located in eight States.

Representative VAN ZANDT. Can you break them down by State?

Mr. LOWENSTEIN. I can give you the eight States. I would like to furnish that for the record, if I may.

Representative VAN ZANDT. Very well.

Representative DURHAM. You just gave it to us a few minutes ago.

Representative VAN ZANDT. I understand that you gave the States by position, but I would like to have the number of items in each State.

Mr. LOWENSTEIN. We will furnish that for the record, Mr. Van Zandt.

(The information referred to follows:)

List of eight States having largest number of byproduct material licensees (as of Apr. 30, 1959)

New York	518	Texas	258
California	455	Ohio	224
Pennsylvania	352	New Jersey	204
Illinois	280	Minnesota	192

Mr. LOWENSTEIN. For source material there are approximately 1,550 licensees. Of these, 65 percent have been issued for uses in eight States. Those are not the same eight States. They are California, Colorado, Utah, New York, Massachusetts, Wyoming, Ohio, and Pennsylvania.

(The information referred to follows:)

List of eight States having largest number of licensees for uses of source material (as of May 14, 1959)

California	264	Massachusetts	80
Colorado	186	Wyoming	71
Utah	151	Ohio	68
New York	141	Pennsylvania	62

Mr. LOWENSTEIN. For special nuclear material, in quantities below a critical mass—that is, in the area which we might turn over to the States under this bill—we have approximately 180 licensees. Sixty percent of these are in eight States. Those States are New York, California, Massachusetts, Pennsylvania, Texas, Ohio, Michigan, and Illinois.

We will furnish a State-by-State breakdown of those for the record.

(The information referred to follows:)

List of 8 States having largest number of special nuclear material licenses (excluding licensees in the Department of Defense) authorizing possession of special nuclear material in quantities which are not sufficient to form a critical mass (as of Mar. 31, 1959)

New York	20	Texas	12
California	18	Michigan	11
Massachusetts	16	Ohio	10
Pennsylvania	16	Illinois	7

Mr. LOWENSTEIN. Of the licensees which are not included in these 3 categories, there are about 55 special nuclear material licensees having quantities which might be sufficient to form a critical mass, and approximately 60 to 65 reactor construction permits or operating licenses.

Mr. RAMEY. On your waste disposal provisions, how do those tie in, let us say, on interstate streams? Would that be one of your excepted categories? I notice in your subsection (b) (i) you could have some waste disposal there, presumably. On the other hand, in subsection (b) (2) (iv) you have further exception from that.

Mr. LOWENSTEIN. Would it be all right if I come to that in just a minute?

Mr. RAMEY. Very well.

Mr. LOWENSTEIN. Before I left these three categories, I did want to point out that under this bill the Commisison, as a State became ready and by agreement with the Governor, could turn over any one or more of these categories. We would not try to break them down. If a State were ready to assume its responsibilities in the way of regulation with respect to byproduct materials, the agreement would provide for a turnover of these responsibilities with respect to this entire category. However, there might be a series of agreements with a particular State adding additional categories as time goes on, and the State program develops. It would be the intention of the Commission under this bill to enter into agreements with the States covering all of these three categories as soon as the States are prepared to assume those responsibilities.

Paragraph (2) of subsection (b)——

Mr. TOLL. Mr. Lowenstein, before you leave subparagraph (1), under your category (iii), source material, could the Commission transfer authority over uranium milling facilities?

Mr. LOWENSTEIN. Yes, sir. By agreement with the Governor of the State when both found the State was ready.

Representative DURHAM. Under the proposed bill you would make a determination as to whether or not the State agency was qualified to handle these hazards.

Mr. LOWENSTEIN. Yes, sir. This bill would require us to make that finding and would also require the Governor of the State to make that finding.

Representative DURHAM. Suppose you have a conflict there; how would you resolve it? You said the Governor or the AEC?

Mr. LOWENSTEIN. Under this bill the Commission would have to make such a finding.

Representative DURHAM. Of course, all you would have to do is publish the conditions in the Federal Register; is that correct?

Mr. LOWENSTEIN. There are procedural provisions in here which would require that a proposed agreement with the Governor be published in the Federal Register, I believe, for 3 consecutive weeks and opportunity be allowed for comment by interested persons.

Representative DURHAM. I was thinking of filing objections such as the procedure we have now, that is, of letting it lie before the Joint Committee for 45 days. What would you think of that?

Mr. LOWENSTEIN. This is a procedure I had not considered. We had tried to provide in the bill a requirement that there be opportunity for the State or other interested people to appear before the Commission and make their views known.

Representative DURHAM. It would be notice, of course, to a State group. Will you think it over, Mr. Graham?

Mr. GRAHAM. Yes, sir.

Mr. RAMEY. I notice that your section (e) (i) does not provide for a hearing as such. It just provides for comment by interested persons.

Mr. LOWENSTEIN. It does not refer to hearing, Mr. Ramey. If interested persons wanted a hearing on a proposed agreement, I am confident it would be Commission policy to allow such a hearing. This does not require that a hearing be held in the absence of a request by someone for a hearing.

Representative DURHAM. You may proceed.

Mr. LOWENSTEIN. Paragraph (2) of subsection (b) which begins at line 5 on page 3 of the House print, specifies those particular areas which the Commission may not turn over to a State. That is, those areas in which the Commission must continue its regulatory control. The first of these is any activity under a license issued by the Commission for the construction or operation of a production or utilization facility. This, of course, at the present time means nuclear reactors.

The activities covered under this provision (i) include but are not limited to the possession and storage at the site of the licensed activity of nuclear fuel, and of source special nuclear material and by-product materials used or produced in the operation of the facility; and the transportation of nuclear fuels to and from the reactor site and the discharge of effluent from the facility.

Coming to the question you asked before, Mr. Ramey, the purpose of this provision is to retain under Commission regulatory control the operation of the reactor. We did not feel that we could begin to cut up that into pieces, so to speak. The discharge of effluent from the reactor involves many questions relating to the design and construction and operating procedures. We did not think it could be considered by itself and broken away from overall responsibility for the reactor operation.

Mr. RAMEY. That would apply to your low level waste disposal, and presumably your high level waste disposal is even more hazardous, that is, which you put into tanks or ship it down to Oak Ridge, as is done now mostly. That would still also be under your control, although once it is separated off it is a little hard to say that is part of the operation of the reactor.

Mr. LOWENSTEIN. Under the licenses which we issue for the operation of nuclear reactors, we would have control over the shipment of any irradiated fuel elements from the facility to a chemical reprocessing plant under this bill. There are not any licensed chemical reprocessing plants. They would fall in the same category as reactors under this bill so we would continue our regulatory controls over the reprocessing plant and shipment of the high level waste products from that plant.

Mr. RAMEY. Where would a reprocessing plant fit in here as a facility?

Mr. LOWENSTEIN. Under (i), the reprocessing plant would be a production or utilization facility.

Representative DURHAM. You may proceed.

Mr. LOWENSTEIN. Yes, sir. The second reserved item is the export from or import into the United States of source special nuclear or by-product material or of any production or utilization facility. We felt that the reasons for excluding imports and exports from State regulatory jurisdiction would not require very detailed explanation. The control of exports and imports is a matter primarily of Federal rather than State interest.

We would like to point out, however, that this exclusion would apply only to the act of importation or exportation and would not affect the authority of the State, with which we had an agreement under this bill, to regulate the possession or use of materials which may previously have been, or might later be, imported or exported.

Mr. TOLL. Mr. Lowenstein, how about transportation of these materials in interstate commerce from one State to another? Would a State have authority to regulate these materials while they were passing through the State on the way to another State?

Mr. LOWENSTEIN. This bill would not affect the jurisdiction of any other Federal agency. It provides by agreement with the Governor for a discontinuance of the Commission's authority. Consequently, the jurisdiction of the ICC, as an example, over interstate shipments would not be affected. It presently has radiation control regulations and those would be continued in effect. They would not be affected by this bill.

Mr. TOLL. On that question, and also on the question of reactors, does this bill go far enough? Does it really clear the air as to whether or not the States have authority to license reactors and control shipments in interstate commerce? Should there be a statement that these activities are expressly preempted to the Federal Government?

Mr. LOWENSTEIN. Under this bill which gives explicit reference to the interests of the Federal and State Governments, we think it would be fairly apparent, as many of us now believe under the existing Atomic Energy Act, that there has been an area of preemption. We considered the desirability of writing the kind of provision you suggest, Mr. Toll, and we decided against it, primarily for the reason that it is practically impossible to try to define, taking into account all of the various gray areas and special circumstances that might arise, where these areas of preemption should begin or end.

Mr. TOLL. Does this bill do anything to clarify the situation as to the Minnesota regulations, for example? Minnesota has no indication from the Federal Government as to whether or not the State of Minnesota has legal authority to license reactors. Does this bill clear the air at all?

Mr. LOWENSTEIN. In this bill, we were not trying to deal with any specific situation. An attempt to legislate generally regarding a specific situation in Minnesota might very well lead us into unanticipated problems.

Mr. TOLL. Minnesota is just an example of the first State that has attempted to license reactors. It is clearly foreseeable, I would think, that other States are going to try to do this. Should this bill attempt to spell out whether or no they are encouraged or whether they have the legal authority to do this?

Mr. LOWENSTEIN. I think this is a suggestion that is certainly worth giving considerable consideration to. The problem, I think, that you run into is that when you begin to specify one thing such as licensing, then you create questions and perhaps leave inferences as to what the State's authority might be in other details.

For example, the Minnesota regulation has a number of kinds of requirements. One is a registration type requirement. The other is a license requirement. It could very well be that although the courts would hold the license requirement to be invalid, they might well sustain the information requirement.

Mr. TOLL. I don't want to take too much time here, but it could be clarified by instead of just saying, "No agreement shall provide for discontinuance of authority by the Commission," it could say that and go further and say that "The Commission shall have sole re-

sponsibility for regulation with respect to," and then list the same activities. Then the States would know, if this was the legislation, that these are areas in which they are to stay out.

Representative DURHAM. I think it may be wrong, but in section 2 on page 3 your agreement entered into pursuant to this subsection shall provide for discontinuance of any authority of the Commission with respect to, and then it goes on to say any activity under a license issued by the Commission.

Under the present setup you are going to be the sole owner of the fuel rods and the radiation material. You are not going to sell that to them under the present law. It is clear that you are going to hold onto this and they can license all they want to. If they want to give a license it is none of our business. They just won't get the fuel rods and the radiation materials. Wouldn't that be the end result?

Mr. LOWENSTEIN. We thought that this act without saying in so many words did make clear that there is preemption here, but we have tried to avoid defining the precise extent of that preemption, feeling that it is better to leave these kinds of detailed questions perhaps up to the courts later to be resolved.

Representative DURHAM. I don't agree in writing an act like that. I think it should be clearly defined and understood what is our field and what is their field.

Mr. LOWENSTEIN. I think this does do that, Mr. Durham.

Representative DURHAM. I think so, too. If they want to set up a licensing system, they can do it. The courts will decide it, then, not us. I think the law should be as clear as possible to avoid litigation. I am not a lawyer, but I wonder if that is not a pretty clear statement of what we intended to do, and what we are writing into the act.

Mr. RAMEY. We are making some pretty good legislative history on what the intention is right now.

Representative DURHAM. Of course, I say I am not a lawyer.

Mr. LOWENSTEIN. The third area which is excluded from an agreement—that is, the third area in which the Commission must continue its regulatory controls—is the disposal of byproduct, source or special nuclear waste material into the ocean or sea as defined in regulations or orders of the Commission. This exclusion is included because the ocean disposal of those materials will frequently involve the interests of a number of States, and may also involve international considerations.

The Commission is authorized in the exclusion to define by regulation or order what constitutes disposal of material into the "ocean or sea" for purposes of this provision, because otherwise difficult problems of statutory construction might arise. Under the exclusion the Commission would be authorized to reserve for the continued exercise of the Federal regulatory control the disposal of source, special nuclear and byproduct material into the oceans, such areas as the Gulf of Mexico and also in appropriate cases into harbors or waterways under circumstances where disposal into the harbor or waterway might result in significant contamination of an ocean or sea.

The fourth area as to which the Commission would be required to continue its regulatory controls is such other disposal of byproduct, source or special nuclear waste material as the Commission determines by regulation or order should, because of the hazards or po-

tential hazards, not be so disposed or without a license from the Commission.

This provision gives the Commission authority and flexibility for the continued exercise of Commission regulatory controls for such disposals as the Commission determines require the continued exercise of its controls because of the hazards or the potential hazards involved in the disposal. It is anticipated, for example, with respect to burial that the Commission would reserve this area as to significant quantities or types of materials for continued Federal supervision. The disposal by burial of significant quantities of radioactive materials might present unique and difficult problems requiring continued Federal control.

As Dr. Lieberman testified on Tuesday, the burial of fission products and other radioactive materials having a long half-life might require continued regulatory supervision for centuries or even millenniums after burial.

At the present time the Commission does not permit the disposal by burial of significant quantities of radioactive material except on Commission-owned sites.

One of the reasons why we have provided for some flexibility in this provision is that many of the States are developing good working relationships with neighboring States to provide for the joint control of pollution of waterways which are of mutual interest to them. It would be the policy of the Commission under this bill to encourage the States to extend these arrangements to the disposal of radioactive materials into rivers and other waterways or to enter into new arrangements for the protection of their common interests. Such arrangements could make it possible for the Commission, under this provision, to discontinue its regulatory controls in some States and regions over the disposal of radioactive materials into rivers and streams.

Representative DURHAM. Does that complete your statement?

Mr. LOWENSTEIN. This is on the one subparagraph of subsection (b). I have not got a prepared statement. I thought if you would like I would continue going through the bill, but I will do whatever you suggest.

Representative DURHAM. We will have to speed it up a little bit because we have other witnesses to appear this morning, and we have to be away at 11:30.

Mr. LOWENSTEIN. I can finish up in 10 to 15 minutes, if that is agreeable.

Representative DURHAM. I think it is important that you do this. You may proceed.

Mr. LOWENSTEIN. The next provision of subsection (b) would provide that the Commission under appropriate regulations could require that manufacturers or producers of devices and other products containing radioactive material get a license from the Commission. There are two main reasons we have put this provision in here.

First let me say it does not detract or derogate from any authority given to a State by agreement under this bill, but the main reason for putting the provision in is to assure that there is continued control at the Federal level over consumer products containing these materials which people might decide to make and sell.

The other is that under this provision the Commission could establish minimum manufacturing specifications, and this would provide

a degree of uniformity for these products, most of which enter into interstate commerce.

Representative DURHAM. Does that apply to X-ray machine?

Mr. LOWENSTEIN. No, sir.

Representative DURHAM. It would not?

Mr. LOWENSTEIN. This would apply to thickness gages, various devices that contain luminous paints, and other things that are presently under our jurisdiction. It would not apply to X-ray machines or radium which we have no jurisdiction over now.

Representative DURHAM. It would apply to a cobalt machine.

Mr. LOWENSTEIN. Yes, it would.

Representative DURHAM. That is an X-ray machine used in hospitals throughout the country.

Mr. LOWENSTEIN. This would apply to the cobalt 60 unit. It would apply, however, only at the point where the manufacturer sells the cobalt 60 machine.

Representative DURHAM. You have to sell him the cobalt before he manufactures the machine.

Mr. LOWENSTEIN. Yes, sir. If we had an agreement with the State, the State would control hazards in the manufacture of the cobalt 60 machine, the State might control any hazards in the use of the machine, but this provision would say that the Commission might require a license before the machine is sold by the manufacturer.

Representative DURHAM. If somebody put strontium 90 on a watch dial, could you control that?

Mr. LOWENSTEIN. We could require under this that before the manufacturer sold the device, he would have to get a license from the Commission. Under that we might authorize it or not. If we did authorize it, we would prescribe the minimum manufacturing and labeling specifications which have to be met.

Representative DURHAM. There has been a question about that recently, is the reason I asked the question.

Mr. LOWERSTEIN. Yes, sir.

I will skip over at this point, Mr. Chairman, to subsection (c). It is intended merely to say that any agreement we might have with the State would not affect whatever regulatory authority the Commission has for purposes of protecting the common defense and security.

Subsection (d) establishes the basic findings which the Commission and the Governor of the State would have to make before an agreement was made. They are that the Governor and the Commission must find that the State has a program for controlling radiation hazards which is adequate to protect the public health and safety with respect to activities within the State covered by the proposed agreement.

The Commission must also find that the State program is not incompatible with the Commission's program for controlling radiation hazards.

Representative DURHAM. Mr. Ramey desires to ask a question.

Mr. RAMEY. In that connection, would the Commission develop any standards or guides for States that would want to qualify for an agreement so that they would know what they would have to do?

Mr. LOWENSTEIN. Yes, sir.

Mr. RAMEY. And also for other interested groups?

Mr. LOWENSTEIN. Yes, sir. We would plan to work with other interested Federal agencies. The Department of Health, Education, and Welfare, the Interstate Commerce Commission, the Department of Labor, and with other outside groups such as the Council of State Governments, and the National Committee on Radiation Protection, and with other interested individuals and organizations.

Mr. RAMEY. This is pretty general in your language. You might want to have standards as to number of personnel, the qualifications, the radiation standards that they use, and so on.

Mr. LOWENSTEIN. We think that these standards would need to cover those matters, Mr. Ramey, but we felt that until we had a statutory framework to develop them in, it was premature to begin consulting with those groups.

Mr. RAMSEY. Would it be objectionable to provide in the law for the establishment of such guides and standards so that there is some assurance that these will be observed?

Mr. LOWENSTEIN. This would be our intention. For that reason I would not see that would create any difficulty.

Subsection (e) provides the minimal procedure requirements that we referred to before as to publication in the Federal Register, and opportunity for comment before an agreement becomes effective.

Subsection (f) is an implementing provision which authorizes and directs the Commission to grant exemptions from licensing requirements of the act where this is necessary or appropriate to carry out an agreement with a State.

Paragraph (g) authorizes and directs the Commission to cooperate with the States in formulating standards for protection against radiation, to assure that State and Commission programs for protection against radiation hazards will be coordinated and compatible.

Subsection (h) provides statutory encouragement for the program which the Commission has and which is developing further for cooperative inspection activities.

Subsecton (i) provides that the Commission on its own initiative after notice and opportunity for hearing or on request of the Governor may terminate or suspend its agreement with the State and reassert the authority vested in it under the Atomic Energy Act, if it is found that this is necessary to protect the public health and safety.

Representative DURHAM. I believe the Governor's conference raised some question, although they did not object to this. I believe they did question the advisability of incorporating this in the act. I don't recall now what the objection was. Did you read Governor Smylie's statement?

Mr. LOWENSTEIN. As a matter of keeping this committee informed, we have had a good many discussions about this provision. There seem to be a number of mixed opinions concerning whether or not this provision should be retained in the bill or deleted. Some of the State officials that we have talked to, and others, have opposed this provision as a matter of principle. They felt as a matter of principle it might be inconsistent with the other general objectives and philosophy of the bill.

There has also, however, been considerable sentiment that in the atomic energy field we are dealing with an area where one just can't

be sure that some major unforeseen problems might arise which might require the exercise of this reserve power.

Representative DURHAM. They seem to read into this subsection (h) a lack of faith in the States. I don't see that in subsection (h). I think it is more or less a protective thing than it is a lack of faith.

Mr. LOWENSTEIN. Yes, sir; this is not to indicate any lack of faith. I would like to say, Mr. Chairman, if this provision is in the bill, if the bill is enacted, we would not plan to conduct any sort of constant surveillance or inspection program over the States' activities. The provision, as you suggest, is designed as a reserve power and it is the kind of thing which one would not ever expect that there would be a need to exercise, and it would be exercised only if some presently unforeseeable situation would develop, or in the most unlikely event that there might be a breakdown of a State program.

Representative DURHAM. He makes a further suggestion as to whether or not it should be permanent or terminate in a certain number of years. I think if the mater does not work, it is usually taken up for consideration at some point by the Congress. I say if that did happen, Congress could remedy the situation.

Mr. LOWENSTEIN. Yes, sir.

Representative DURHAM. You may proceed.

Mr. LOWENSTEIN. Subsection (j) is intended to make it clear that nothing in this bill is intended to affect or derrogate from the authority of any State or local agency to regulate activities, which are licensed by the Commission, for purposes other than protection against radiation hazards. Subsection (k) is included in order to provide formal statutory recognition of the fact that even with respect to the reserved areas which the Commission would continue to regulate, and which to some extent would be preempted from State regulation, nonetheless the States have a very real interest in these activities. So it provides that with respect to each application for Commission license authorizing an activity as to which the Commission's authority is continued under paragraph 2 of subsection (b) the Commission must give prompt notice to the State or States in which the activity would be conducted of the filing of the license application.

It also requires the Commission to afford reasonable opportunity for State representatives to offer evidence, interrogate witnesses and advise the Commission as to the application, without requiring such representatives to take a position either for or against the granting of the application. That is, it is clear that they would not be required to appear in the role of an adversary. This is a statutory provision. Of course, it is not a replacement for good working relations. We did feel it was appropriate to give this kind of statutory recognition to the interests of the States in these reserved areas.

The final subsection Mr. Chairman, just contains definitions of State and of Governor. It may appear that the definition of Governor as meaning the chief executive officer of any State is redundant, but we wanted to be sure that we had covered the District of Columbia, which does not have a governor, so it is defined as meaning the chief executive officer.

That would conclude my remarks.

Representative DURHAM. Thank you very much, Mr. Lowenstein. Are there any questions? Mr. Price?

Representative PRICE. I would like to ask Mr. Graham a question on his statement which I have read. Unfortunately I was detained and did not hear the presentation of it.

On page 8 Mr. Graham, you said, "The specification of areas which might be turned over to the States should not be regarded as the ultimate disposition of responsibility."

Does "ultimate" also mean final disposition, or does it mean you are thinking of other areas that might come later that you would also want to turn over?

Mr. GRAHAM. Mr. Price, what we were trying to say here is that this is not the end of the road. This we think is just the beginning. As the States take over these responsibilities and move along, it is our belief and hope that there would be other areas, within this framework, which could be turned over to them subsequently.

Representative PRICE. Conversely, does it mean also, since this is a new approach in a new field in which we are working, that you might feel that you may be turning over some jurisdiction in areas that you may later believe should be exclusively in the Federal province?

Mr. GRAHAM. I am afraid I missed the import of your question, Mr. Price.

Representative PRICE. Since you may be disposing of some jurisdiction in areas that later on the Commission or the Federal Government may feel should be more closely exercised by the Federal Government rather than the State, would you want it then returned to the Federal Government?

Mr. GRAHAM. I think there is flexibility in this bill so that it could come back to us if that turned out to be the case. As Mr. Lowenstein suggested, if something unforeseen were to happen perhaps a State might feel that this is something that should be returned to the Federal Government.

Representative PRICE. The point is that once you do relinquish this area to the States, it becomes extremely difficult for the Federal Government later to legislate in the same area.

Mr. GRAHAM. Yes, sir. I think that is a fair assumption. Once you have turned it over, the presumption is that they are able to carry on and discharge the paramount responsibility for public health and safety. But I think the point that Mr. Lowenstein and Chairman Durham were trying to make is that this is something that is so new.

Representative PRICE. That is the reason I referred to your statement "It should not be regarded as the ultimate disposition of responsibility." The ultimate may mean that there may be other areas.

Mr. GRAHAM. Yes, sir.

Representative PRICE. You don't mean to consider a final disposition? Once you turn it over, you want to be reasonably certain that this is an area where there will be no conflict between the State and the Federal Government.

Mr. GRAHAM. I think it expressed the thoughts, sir, that we were starting out in a new area and are talking about turning over to the States certain particular items. I am not sure that you were here, sir, when Mr. Lowenstein named some of them. The purpose of this statement was simply to say that this is where we would like to start. We do not consider this a one-shot proposition. Hopefully there will be other areas in the future. Let us try this and then see.

Representative PRICE. In the hope that you don't turn over any areas that you subsequently feel will have to be returned to the Federal jurisdiction.

Mr. GRAHAM. Hopefully not, sir.

Representative PRICE. Because it would be extremely difficult to get them back.

Mr. GRAHAM. Yes, sir.

Representative PRICE. On page 2 of your statement in which you refer to the studies that are being made, the question as to whether and how responsibility for radiation protection should be reallocated among agencies of the Federal Government, you list a group of agencies now studying that question. The Bureau of the Budget is included. Do they have a technical staff and scientists that should bring them into the basic study of such a problem?

Mr. GRAHAM. Sir, I would not be qualified to talk about the technical capabilities of the Bureau of the Budget.

Representative PRICE. I can see that after a study is completed, and you are about to make a policy decision of where these responsibilities should lie among the Federal agencies, and when it is necessary for them to have appropriations to carry on, where the Bureau of the Budget might enter into the picture. But we have had assurances from the Bureau of the Budget that they make no technical decisions, that they don't overlap other Government agencies. They don't have within themselves scientific groups and other groups that duplicate the performance of people in other agencies. I just wondered why they would be in on the initial phase of this study?

Mr. GRAHAM. I could only speculate. I would assume that they are an arm of the President who wants to make a study to determine whether some or perhaps all of the activities of the AEC in this area should be turned over to the Public Health or not.

Representative PRICE. I don't see where the financial end of that should come until you made a decision on the best program. I don't think the initial decision should be based on budgetary considerations, but what is best for the program and for the Government. Then after you arrive at these conclusions, then you might get into the matter of cost. If you base the study strictly on the matter of cost, you might interfere in the formation of the best conceivable program.

Mr. GRAHAM. I assume, sir, that the Bureau of the Budget does have a great deal of competence in the question of the management. I assume that probably the way they are looking at this is on the basis of a functional approach.

Representative PRICE. We assume they do, too, although they say they don't. They say they don't get into these areas, that they make no technical decisions.

The point I am getting at is that a study of this sort should be based initially, if you want a good honest and thorough study, on the merits of a program and what would be the best. Then after you arrive at that conclusion then you might try to determine whether or not you can afford it. But if you just say that the Bureau of the Budget is going to let you have just so much money to do it, then you might not come up with the best program. You might come up with the second, third, or fourth best.

Mr. GRAHAM. Mr. Price, I am sure you understand that I am in somewhat of a difficult position to talk about this.

Representative PRICE. Yes, I know. It is very interesting that the Bureau of the Budget would be involved in the initial study of this nature. That is all I have.

Representative DURHAM. Mr. Toll.

Mr. TOLL. Mr. Graham, I would like to ask one or two questions about your general philosophy of this bill as opposed to concurrent responsibilities between the Federal Government and the States which was represented by your proposed bill of 2 years ago. Is it the Commission's feeling or why do you now recommend that certain areas should be clearly the States, on the one hand, and other areas should be clearly in the Federal Government? Why do you prefer this approach to a concurrent responsibility approach?

Mr. GRAHAM. Mr. Toll, in considering this matter, we were trying to look at it on a functional approach and of trying to set up, as we did on Tuesday, the major areas of what we are doing now, and how we are doing it. In other words, first to try to analyze that, and then to see which of these functions could be turned over to the States.

In going through that kind of a process, we came to the conclusion that the areas which we have discussed here were susceptible of being turned over to the States.

I think the question of concurrent jurisdiction is one that certainly has had some legislative sanction heretofore. For example, it is my understanding that the Federal Coal Mine Inspection Act of 1952, which is noted on page 414 of your committee print, points out that the Bureau of Mines could take back some function that has been previously worked out with the State under certain conditions. This is certainly a matter of great interest to the Congress, I should think. This is one way of having this matter brought specifically to the attention of the Congress and hearing the views of all the people involved.

I just wanted to point out to you by reference to the Coal Mine Inspection Act of 1952 that this is not a case of first impression. There is some precedent for it. Perhaps Mr. Lowenstein might like to make an observation on the point, too, sir.

Mr. LOWENSTEIN. By concurrent jurisdiction, Mr. Toll, I assume you mean both the Federal Government and the States having fairly coextensive responsibilities. To particularize a little bit on what Mr. Graham stated, and as I think some of the reports in the splendid joint committee print point out, there is a scarcity of manpower in these areas. Concurrent jurisdiction would be wasteful of manpower, we think. It would be wasteful of funds. We think it leads to divided responsibility and may lead to bad safety controls because you have too many cooks in the broth, so to speak, without any one level of government having a primary responsibility for it to assure that these uses of materials are appropriately regulated.

Moreover, as these reports in you study point out, concurrent jurisdiction would subject users of these materials to the burdens of procedural dealing with a great many different agencies on the same questions. Some of the Commission's procedures, for example, are very elaborate and detailed. It would be unfortunate for these universities and industrial firms and hospitals to have to go through this procedure twice or perhaps more often.

Another difficulty which we had with the old 1957 bill was that it provided concurrent jurisdiction, and it did not provide—this ties

in with what I said before—for centralized responsibility. Under the new bill when a State is ready, the AEC would discontinue its regulatory controls by agreement with the Governor.

Mr. TOLL. I think that is fairly clear as to section 272(b)(1) in the bill. But in subsection (b)(2), you perhaps have left an area for concurrent responsibility, it seems to me. You could have situations where the Commission is regulating but the States are regulating also. Are you intending to have concurrent responsibility in (b)(2) or not?

Mr. LOWENSTEIN. We do not intend to have concurrent responsibility under (b)(2), Mr. Toll. The first area specified there is reactors. The second is export and import of the three radioactive materials under the Commission's jurisdiction. There is land burial, other burial which the Commission might determine by rule. We do not conceive of (b)(2) as providing for concurrent jurisdiction. We just didn't think it did. Does that answer your question?

Mr. TOLL. Yes.

Representative DURHAM. Thank you very much, Mr. Graham and Mr. Lowenstein.

We have to adjourn, since we have another meeting at 11:30, and will resume again at 2 o'clock this afternoon in this room.

(Thereupon, at 11:30 a.m., a recess was taken until 2 p.m., the same day.)

AFTERNOON SESSION

Chairman ANDERSON. The committee will be in order.

In view of the fact that we did not get quite as far this morning as we would have liked to, I think we better start now. Dr. Porterfield.

STATEMENT OF DR. JOHN D. PORTERFIELD, DEPUTY SURGEON GENERAL, ACCOMPANIED BY DR. FRANCIS J. WEBER, PUBLIC HEALTH SERVICE

Dr. PORTERFIELD. Thank you, sir.

Chairman ANDERSON. I am sorry we did not get to you this morning, but we had other things to do.

Dr. PORTERFIELD. That is quite all right, sir.

Mr. Chairman, members of the committee, I am Dr. John D. Porterfield, the Deputy Surgeon General of the Public Health Service, and presently the Acting Surgeon General. I appear here today to represent the Department of Health, Education, and Welfare with reference to the two bills proposed for amendment of the AEC Act. I have with me Dr. Francis Weber, the Chief of the Division of Radiologic Health of the Public Health Service, and Mr. Conley, of the General Counsel's office of the Department.

To identify myself, I would like to say that I have been in the Public Health Service since 1939 as a commissioned medical officer with not only medical training but graduate training in public health. During that time I have been assigned for a period of 7 years as the director of health for the State of Ohio on leave of absence from the Public Health Service.

I appreciate very much the opportunity to appear before the committee this afternoon. There was no time for the Department to

develop any formal statement with respect to this proposed legislation and with your permission, therefore, I will speak from notes.

I should not at the outset, as has been read into the record before, that the administration approves the enactment of legislation along the lines of this proposed bill.

The Department of Health, Education, and Welfare, in addition, endorses the objective of this bill, which we conceive to be the promotion of State competence and the progressive relinquishment to States of certain responsibilities in this field of radiologic health. We agree, too, that the described method in the bill is one reasonable approach to its achievement.

Because of some variation in our experience and our point of view, and therefore our emphasis, we would like the privilege of describing the possibility of another way of accomplishing this same objective which the committee may wish to consider along with the legislation as introduced.

The other day, on May 19, Dr. Price, appearing for the Public Health Service, described for you the methods of operation in States, and in general their competency in the health protection of the public. The problem of radiologic health protection obviously must contemplate all sources of radiation, whether those from sources controlled by the Atomic Energy Commission or from other sources.

As Commissioner Graham said this morning, the non-AEC controlled sources are certainly numerically the greatest and constitute the oldest problem in this field. However, the low level of activity of this numerically greater number of sources in the past led to a fairly routine kind of an approach priority wise in State health programs as they considered their total responsibility. It is the numerically smaller radiation hazards from AEC sources which really have dramatized the problem, have given it a considerable amount of public sensitization, and have certainly demonstrated the future potential of the dimensions of this problem.

This has happened at the same time that we have recognized in the medical field a very rapidly growing use of both diagnostic and therapeutic X-rays. The combination of these two increases in source of radiation energy applied to people has created a renewed and a very substantial demand for a step-up in control activities in the country in general.

It seems to us that the States' general resources must certainly be stimulated for an accelerated entry, or, if they are already in it, for an accelerated expansion in the field of radiologic health and radiation hazard control. The alternate to something like the AEC's proposal to begin to give the States some authority in this field would be a very excessive expansion in the Federal responsibility, in the Federal inspection and police forces and development of a Federal educational campaign, and so on. It would seem to us that this is both costly and duplicative. So that the present proposal is timely.

Security, as we speak of it here in testifying now, we consider in two ways: Security of the people's health, at the same time recognizing the problem of the security of the national welfare. We recognize the continued and perhaps permanent necessity for Federal responsibility for this national security, at least for some time in the

promotion of this industry so vital to our modern world, and for the execution of a good occupational health program in its own installations, with its contractors and its licensees, an occupational health program that keeps in mind health not only of the employees in such installations, but of the neighbors of such installations.

The method, therefore, that should be adopted to exploit this objective must stimulate the States to assume competent responsibility, and this be done without any loss of contact with the withdrawal of any Federal responsibility in this process. The Federal withdrawal cannot be faster than the State assumption of responsibility. The method should also provide for the ability to return as well as retreat, to recapture a responsibility where presently unforeseen eventualities might require after it has been released, I think with a point beyond which Federal responsibility would have to be retained in all events.

All of this is said in support of the objective of the bill. As to the method, an alternative method to that proposed by the Atomic Energy Commission in the introduced bills, which the Commission might wish to consider, is the one based on concurrent jurisdiction. Under this method the States would be given their traditional responsibility for taking such steps as are necessary for the protection of the public health. It would be placed in that area of government whose basic organizational structure, whose present network of people and facilities, is such as to permit the development of the most effective comprehensive coverage. But the Federal Government at the same time under the method of concurrent jurisdiction would reserve to itself that which it cannot responsibly abandon, and would reserve to itself the right to cover those areas which the States did not assume. In order to protect the overwhelming Federal interest during this transition process it should reserve the right to prevent conflict between the two authorities.

In other words, language of this nature:

> Nothing in this act shall be deemed to prevent the States from adopting, inspecting against, and enforcing standards not in conflict with those adopted by the Commission for protecting the health and safety of the public from radiation hazards incident to the processing and utilization of source, byproduct, and special nuclear material.

Mr. TOLL. Doctor, is that more or less along the lines of the bill proposed by the AEC in June 1957?

Mr. PORTERFIELD. Yes, sir.

Chairman ANDERSON. Are you reading from that?

Dr. PORTERFIELD. That passage I just read is from the 1957 bill.

Chairman ANDERSON. Paragraph (b) in section 274?

Dr. PORTERFIELD. Yes, sir. Across-the-board recognition of concurrent jurisdiction that is suggested here would in no respect impinge upon any national interest in the protection of the public health and safety against these hazards. If it is felt, however, that in certain areas of activity involving these radioactive materials, there are overriding national concerns, particularly those not within the competence of health, and other than those of the public health and safety, which would make recognition of concurrent State jurisdiction inappropriate at any particular time, the provision which I read could be correspondingly modified by some reservations.

The committee might consider, however, that such exceptions should be kept to the necessary minimum, and in no event prevent

the exercise of State authority with respect to any area of activity in which that section of the 1957 bill or the present bill recognizes at least potential State competence. The legislation might direct that the necessity for any exceptions upon the basis of state jurisdiction be reexamined at appropriate intervals which would be fixed in the bill and that a report of such reexamination with accompanying recommendations be made to the Congress.

The committee moreover may wish to put in the bill an affirmative policy declaration which in addition to recognizing concurrent State jurisdiction declares the desirability of discontinuing from time to time the exercise of Federal protective or regulatory functions to the extent that this would be consistent with those functions. That is, defense, international affairs and the like, for which the Federal Government must of necessity continue to exercise responsibility.

Also in the light of these suggestions, it might be more appropriate to base progressive relinquishment of Federal jurisdiction in this field upon unilateral determinations made by the Commission after consultation with the States concerned, and with the Public Health Service, rather than upon the State-by-State agreements. This method would say the same thing as the current draft of the bill says, but to a considerable degree from an obverse position. As opposed to doling out to the States in progressive legislative actions fixed blocs of assigned authority, it would allow a smoother development up to the limits of the ultimate Federal reservation of an effective State-sponsored program under the blanket and security of the continuing Federal responsibility.

Mr. TOLL. Doctor, may I ask you a question on that? Dr. Wilson, the head of the Department of Health in the State of Texas, testified before the committee yesterday. He stated, if I recall correctly, that there was a need for clarification. In his opinion at the present time the States did not know what they could do and what they could not do. He urged that the act spell out which was the State's responsibility and which was the Federal responsibility.

Would you care to comment on that?

Dr. PORTERFIELD. I can understand the desire to have a very clear definition of the division of responsibility, but I think that by any devices presently proposed this would be more apparent than real in actual practice. By the same token there is now a clear definition of the distribution of authority as between non-AEC controlled sources of radiation and AEC controlled sources, in spite of which Dr. Wilson says that the present situation is confused. I think that there would be a better ability for clarity, in my own experience with States and with the Federal Government from the State point of view, if a mutual program planning sort of arrangement could be made in which both the State and the Federal Government had responsibility. It would seem to me as a personal point of view that the State responsibility is the ultimate permanent responsibility as it is in keeping with the traditional responsibility of the State for the health of its citizens. It is the Federal Government by a positive action that reserves the right to maintain control of those things which are in the national security or which the States may defect in.

Mr. TOLL. May I ask you this question. The nub of it perhaps comes down to who has the responsibility for inspection and enforcement. This morning AEC indicated that they had approximately

4,700 isotope licensees, of which 55 percent were located in some eight States. It was their proposal in this legislation that they would enter into agreements with these States to turn over responsibility for inspection and control over these isotopes to the States as they were qualified. Under a system of concurrent responsibility, who, in your opinion, would have the job of inspecting these 4,700 isotope licensees of the AEC?

Dr. PORTERFIELD. It would seem to me that the two methods are not too much in conflict. In the situation which you describe I would expect that the AEC would continue to have this responsibility until such time as it found that the regulations or code a State might adopt and the program which it would establish was capable of performing this function for them in the areas in which the AEC felt it could relinquish this control. The only difference as I see it between the two methods which we have under discussion is that by the method we are describing this afternoon there is a smoother, more flexible method of negotiating this relinquishment of the Federal activity in the program.

Mr. TOLL. I would ask your counsel, then, whether he thinks the AEC has any legal authority under existing law to relinquish its responsibilities to continue inspecting these isotope licensees, or isn't some sort of amendment to the act necessary before they can stop their inspections?

Mr. CONLEY. I would certainly defer to AEC as to the extent and nature of their own authority. I think we are both talking about alternative legislative proposals, and presumably if the committee felt that a concurrent jurisdictional approach were the preferred one, then the legislation which authorized and asserted concurrent State jurisdiction in certain areas would itself resolve any problem as to the AEC's jurisdiction to relinquish or to retain or as to the State's jurisdiction to regulate or inspect in the field that the legislation pointed out it had concurrent jurisdiction.

Mr. TOLL. As long as you have concurrent jurisdiction, there still is a responsibility in the AEC to continue inspections.

Mr. CONLEY. Yes. It would be a responsibility geared to its responsibilities for accomplishing its own objectives in the national interest, and also an authority to protect the public health and to cooperate with the States in assuring that there were no gaps as it withdrew and the States advanced.

Mr. TOLL. As I understood the AEC testimony this morning, they said they had these large numbers of licensees of these isotopes, source materials, amounts of special nuclear materials less than a critical mass, and that they would like to have authority to enter into agreements with States to withdraw their responsibilities. Now, if you prefer the 1957 bill, you would deny them authority to enter into such agreements.

Mr. CONLEY. The impact of the bill would be immediately to confer upon the States the legal jurisdiction to inspect and regulate in that area, and you would have a situation parallel to that which exists in a great many fields of Federal-State overlapping interests—the whole field of interstate commerce, where it stops and starts, and all kinds of areas in which the Federal Government has asserted some responsibility which in effect overlaps that of the States. I

think the unique thing here is that the Federal Government's role is now practically exclusive and you have to arrange a transition so that the Federal Government does not march out all at once and create a vacuum. Whether that can be arranged readily under the concurrent jurisdictional approach is in doubt.

Mr. TOLL. I don't see how it can be arranged under the concurrent jurisdiction because under concurrent jurisdiction, just by the meaning of the words, the Federal responsibility remains. It is a concurrent responsibility. They can't let go of it. Whereas under the AEC proposal they could let go of it and turn it over to the States.

Mr. CONLEY. Are you saying that there would be some doubt as to the authority of the Atomic Energy Commission to withdraw from its present activity?

Mr. TOLL. Absolutely. The act now requires the AEC to license and regulate these materials.

Mr. CONLEY. It would depend on the meaning of concurrent jurisdiction, and I would think that the bill could make that clear, and at the same time, make it clear that the States have jurisdiction.

Dr. PORTERFIELD. One disadvantage was mentioned this morning of this method of concurrent jurisdiction, which is the double checking of licensees. It is true that this can occasionally be distressing, but at the same time the double checking has a rather assuring feature to it in that it permits the double checking of dangers from two points of view. So long as the Federal responsibility was paramount and was maintained as such differences of opinion could not lead to dangerous situations. Whatever method the committee recommends to carry out this introduction of the States into this previously relatively exclusive field, the Department does very strongly believe that the basic legislation and the objective should be achieved by the enactment of some legislation.

That is all of the prepared information which we have to provide. If there are any questions I would be very happy to answer them, sir.

Chairman ANDERSON. I think not. Thank you very much. We will have a problem of deciding what this jurisdiction ought to be as far as we can see it. We appreciate the help of the Public Health Service.

Mr. FERGUSON.

STATEMENT OF HON. JO M. FERGUSON, ATTORNEY GENERAL OF KENTUCKY

Mr. FERGUSON. Mr. Chairman, my name is Jo M. Ferguson. I am attorney general of Kentucky and vice chairman of the Committee on Atomic Energy Law of the National Association of Attorneys General.

Our committee was established in 1957. Shortly thereafter it cooperated in the effort which led to the enactment of Public Law 85–744, establishing an exemption from the financial protection requirements of Public Law 85–256 with respect to licenses issued for the conduct of educational activities by nonprofit educational institutions. We are informed that under the provisions of the law 17 institutions have been tendered interim indemnity agreements by the Atomic Energy Commission.

In March of this year, the chairman of our committee, Attorney General Norman Erbe of Iowa, testified before this committee in connection with its hearings on employee radiation hazards and workmen's compensation.

As further evidence of our association's interest in atomic energy matters, I might add that our Committee on Atomic Energy Law cooperated with the Committee on Suggested State Legislation of the Council of State Governments in the development of several items relating to this subject which are to be found in suggested State Legislation — program for 1959 and in the joint committee print "Selected Materials on Federal-State Cooperation in the Atomic Energy Field."

Mr. Chairman, our committee assisted in the development of the proposed bill submitted to you by the Atomic Energy Commission. We, as well as other State officials, were consulted by the staff of the Council of State Governments to assist them in evaluating and recommending appropriate changes in the draft bill prepared by the Commission.

With respect to current efforts to clarify federal-state relations in this field, our association, composed of the chief legal officers of all the States, including Hawaii, the Commonwealth of Puerto Rico, and the Territory of Guam, at its most recent annual meeting approved the following resolution:

FEDERAL-STATE RELATIONS IN THE ATOMIC ENERGY FIELD

Be it resolved by the 53d annual meeting of the National Association of Attorneys General, in New Orleans, La., on May 7, 1959, That this association urges the several States to consider carefully the proposals for State legislation in the atomic energy field and workmen's compensation developed by the association's Committee on Atomic Energy Law and the Committee on Suggested State Legislation of the Council of State Governments and contained in Suggested State Legislation—program for 1959 and the supplement to the 1959 program of suggested State legislation; and be it further

Resolved, That the association records its views that the longstanding and basic responsibilities and programs of the States for protecting the public health and welfare should be recognized in Federal legislation and that Federal-State relations in the atomic energy field should be clarified; and be it further

Resolved, That the President is authorized to continue the Committee on Atomic Energy Law, empowered to cooperate, in the future as in the past, with the Congress, the Atomic Energy Commission and other Federal agencies, and with the Council of State Governments and its committees for the further clarification of Federal-State relations in this field as well as for the development of suggested legislation and intergovernmental administrative arrangements.

Mr. Chairman, there is a question as to the extent to which the Atomic Energy Act of 1954 preempted, or may be held to have preempted, the field with respect to the protection of public health and safety from radiation hazards of special nuclear, source and by-product materials. In the present stage of development, it is probably unnecessary to seek a definitive answer to this question. Certainly at the State level, we are aware of the great interest and responsibility of the Federal Government in matters relating to the health and safety aspects of atomic energy. On the other hands, in our Federal system, State governments have always had primary responsibility for protection of health and safety. Furthermore, radiation dangers arising from possession or use of radium and other minerals radioactive in a natural state and X-rays and fluoroscopes are subject only to State regulations and control.

In our view, the bill before you provides a framework within which the several levels of government may operate effectively in the public interest. It provides a satisfactory delineation of responsibility, at least for the new few years, but authorizes cooperation and consultation between and among appropriate regulatory agencies. The bill contemplates, through the use of agreements, assumption by States of such responsbilities as their respective capabilities permit, and it will promote the training of State employees to increase current capabilities. By relieving Federal employees of much regulatory responsibility while assigning such duties to State and local personnel already engaged in similar duties, it will make possible the best use of skilled manpower. The bill is successful in avoiding overlapping authority while leaving no gaps in the pattern of regulatory control.

Mr. Chairman, with respect to subsection (i) of the bill, we have been unable to agree on the necessity or desirability of its retention. Some members of our association—probably a majority, although no vote was taken on this point—felt that the effect of this subsection was to place on a strictly probationary basis the authority granted to the States elsewhere in the bill, particularly since it would appear that subsections b(2) and c provide ample safeguards of the Federal interest. Others felt it should be retained to guard against a contingency that cannot be anticipated with our current knowledge. Some on both sides of this question concluded that the subsection might be retained but qualified by a proviso that after some period of years the authority of the Commission to terminate or suspend agreements should lapse. This would still leave with Congress the option to renew or not to renew the authority when the state of knowledge would permit a more nearly definitive conclusion concerning the merits of the authority.

We should like to make a suggestion with respect to another provision. We prefer the language of the March draft of the Commission for subsection i—now subsection j. In other words, we feel that the words "subject to the Commission's regulatory authority" should be inserted following the word "activities." We think this change would clarify the meaning of the subsection.

Departing briefly from my prepared statement with respect to the now subsection j, I would say that the suggestion made here in our meeting was made by some individual members and was not voted on by the entire association. I think perhaps that my prepared statement is a little stronger than the situation warrants with respect to that section.

At our recent meetings in New Orleans we discussed whether we should take a position on the question of what Federal agency or agencies should have primary responsibility in this area. We concluded that this is an internal question to be settled at the Federal level. We do feel, however, that the proposed bill before you will yield of a pattern of governmental responsibility and intergovernmental cooperation under which real progress can be made in the years that lie immediately ahead.

I think it is only fair to say that we question whether the AEC bill now before you, or any bill which might be enacted at this time, can delineate once and for all the respective jurisdictions of Federal and State Governments in this field. It is our hope and expectation that, under legislation which can be enacted by Congress in the near future, the State and local governments will achieve experience in and

knowledge of the problems involved, and that further delineations, granting more extensive authority and discretion to the States, may be possible a few years hence. It is with this thought in mind that we recommend that this committee and the Congress consider this bill favorably.

Mr. Chairman, members of the committee, I wish to thank you on behalf of the National Association of Attorneys General for having afforded this opportunity to present the views of the association on this important legislation.

Chairman ANDERSON. When Mr. Graham was testifying this morning, he said it might be necessary to review these things every 3 or 4 years or some such time as that. You would agree that this is not necessarily a final determination?

Mr. FERGUSON. Yes, sir.

Chairman ANDERSON. We will have to improvise a little bit, play it by ear, and try to find out how we are getting along, and see where we have gotten in a few years.

Mr. FERGUSON. It was our feeling in our meeting that would be the desirable thing and that this bill is a step in the right direction.

Chairman ANDERSON. I think that is a good statement. Are there any questions of Mr. Ferguson?

Representative BATES. Mr. Ferguson, in reference to the preemption, do you feel that there is some language or intent in the bill which would express that, or do you have reference to the Steve Nelson case?

Mr. FERGUSON. I would not want to get into the doctrine of preemption in this hearing. Perhaps it does not belong here. By the nature of the development of atomic energy, I think the Federal Government preempted that entire field and your 1954 act, of course, was a step in the direction of returning some responsibility to private corporations and thereby to the States and local governments. By necessity, I think, this field was preempted and I hope that this progress in legislation will have a tendency to return some of this authority to the States.

Representative BATES. Do you think it is inherent in the legislation rather than being drawn from the Supreme Court decision?

Mr. FERGUSON. It was inherent in the development of this field under the control of the Federal Government.

Representative BATES. Yes, I understand.

In respect to subsection j, you thought you ought to add the words "subject to the Commission's regulatory authority." Would you speak on that a little bit, please?

Mr. FERGUSON. That was the feeling of some of our people. I wanted to say that not all of our members did feel that was necessary. I think as the bill is written that it is evident that within the field of atomic energy anything the States would do would be subject to the authority of the Atomic Energy Commission within these agreements.

Representative BATES. You feel personally that this language clarifies the situation?

Mr. FERGUSON. Personally I don't feel that it makes any difference. Some of our attorneys general felt it would be desirable.

Representative BATES. From your point of view, you already believe it is included in the intent of the law?

Mr. FERGUSON. I think so.

Chairman ANDERSON. Are there any other questions? If not, thank you very much, Mr. Ferguson. We appreciate you being here.

Mr. FERGUSON. Thank you, sir.

Chairman ANDERSON. Mr. Schwan.

STATEMENT OF HON. ELISHA T. BARRETT, CHAIRMAN, NEW YORK JOINT LEGISLATIVE COMMITTEE ON INTERSTATE COOPERATION, READ BY CHARLES F. SCHWAN, COUNCIL OF STATE GOVERNMENTS

Mr. SCHWAN. Thank you, sir.

Mr. Chairman, my name is Charles F. Schwan, Jr. I am Washington representative of the Council of State Governments. I should like to read the statement of Mr. Barrett, who is a member of the Senate of the State of New York and chairman of the Joint Legislative Committee on Interstate Cooperation and vice president and chairman of the board of managers of the Council of State Governments.

Mr. Chairman, as an agency of the States, the Council of State Governments has a deep and continuing interest in atomic energy developments. As early as September 1956, the council's committee on suggested State legislation proposed to the States that they enact legislation providing for coordination of atomic development. This proposal, with some amendments, is carried again in the council's suggested State legislation—program for 1959. The same program also contains proposals for State legislation, in some instances accompanied by draft bills, with respect to radiation protection, shoe fitting X-rays or fluoroscopes, workmen's compensation laws and radiation injury coverage, and public liability of State and local licensees for atomic incidents.

Still more recently, in February 1959, the Council published in a supplement to suggested State legislation—program for 1959, an analysis of State workmen's compensation laws and their coverage of workers exposed to radiation hazards, along with suggested legislation to assist States in revising their laws to provide adequate protection. These proposals were prepared in cooperation with the Committee on Atomic Energy Law of the National Association of Attorneys General.

Parallel with this effort, the council has sought to find other means to assist States in preparing themselves to fulfill their responsibilities in this field. In May 1957 for example, it called a meeting in Chicago of State and Federal representatives and some private persons interested in atomic energy development and regulation. The current chairman of this committee spoke at a luncheon meeting during the conference. Among other things, the conferees, representing 3 Federal agencies, 34 States, 2 interstate agencies, and 5 private organizations, discussed the draft bill which the Atomic Energy Commission submitted to this committee in June 1957.

More recently, as a part of its dutes as staff to the Joint Federal-State Action Committee, the staff of the council has reviewed successive drafts of the bill submitted recently by the Atomic Energy Commission. In this effort it has received the advice and assistance of a large number of State officials.

Mr. Chairman, on a long-term basis we should like to see the States assume much the greater part of the burden of protection of the public against radiation dangers. We feel that this is a part of their traditional responsibility to protect the public against hazards to health and safety. Admittedly, at the present time the shortage of trained personnel is such that many of the States could not assume their full responsibility. We feel, however, that the reservations of Federal jurisdiction contained in the bill and the agreements procedure will enable the several States to assume as much of the burden as their respective resources permit. In our view the authorization to permit the Commission to provide training for State employees and to make agreements with States to perform inspections and other functions will make it possible for the States to assume greater and greater responsibility as time goes on. We hope that this process will continue so that, in a relatively few years, the States will be able to handle an even greater share of the regulatory burden than this bill contemplates.

The limited character of State activity up to the present time has been due largely to the military nature of atomic energy programs and the secrecy surrounding them. Now that the civilian applications of atomic energy are coming to the fore and information is becoming more available, the opportunities for the States will increase, provided that the Congress produces the proper legal climate to make that possible. Moreover, it is essential that the States be given the chance to develop programs. The alternative would be a duplication on the Federal level of health, safety, factory inspection and other enforcement personnel whose normal base of operations is State government and many of whom are already State employees needing only some additional training to make them effective in the civilian atomic field.

We would hope, Mr. Chairman, that the legislation to be enacted will in no event act as a deterrent to genuine assumption by the States of an increasing measure of responsibility in this field. The agreement approach embodied in this bill has the great merit of enabling States to determine with assurance just what tasks they can assume and thereafter carry on. It must be noted, however, there is a practical disadvantage in this approach, since under the exclusively agreement method now appearing in the bill, a State may be required to go through the entire process of recruiting and training a staff, providing finances, passing enabling legislation and promulgating an administrative code—all before an agreement can be entered into and the staff can be put to work on the actual tasks of regulating.

To remedy that very important, practical disadvantage, therefore, we would like to suggest that the Joint Committee consider rewording subsection j to provide that, absent an agreement, there shall be concurrent jurisdiction in this field. Amendment toward that end might be based on language in the proposed Federal-State cooperation bill which AEC submitted in 1957. If this course is not followed, Mr. Chairman, then we would certainly urge that subsection j should be expanded at least to recognize the rights of the States to require the registration of users of radioactive material, irrespective of the existence of a Federal-State agreement. Some 14 States already have such a requirement. The knowledge obtainable by such a registration process can be of great value to State and local governments, in inform-

ing the public authorities such as police, fire, and health agencies, as well as preparing for entry into an agreement.

Representative ASPINALL (presiding). Mr. Toll has a question.

Mr. TOLL. Has the AEC or anyone else questioned the authority of the State to require registration of radiation sources?

Mr. SCHWAN. To my knowledge, no. I think if there were legislation at this particular time which would set up a procedure for recognizing a certain State's authority via an agreement, there might possibly be some cloud cast on the authority of another State not having an agreement to require registration.

Mr. TOLL. So far as I know, the only legal question that has been raised is the authority of the State to license.

Mr. SCHWAN. We are not suggesting that they should have such authority. Certainly not if the AEC is going to license. There is no virtue in having licenses by every jurisdiction. It was our thought to protect those States not having an agreement but having a registration requirement. Conceivably there is not the necessity. If there should be in the committee's view such a necessity, we certainly would like to have it considered.

As a measure of State interest and responsibility, I should like to point out some of the actions taken by States in this field. I should observe that the information I am about to give is necessarily incomplete. As of early this month, the legislatures of 24 States were still in session and regular sessions were not scheduled in four States this year.

With respect to the proposal that each State establish an office or agency to coordinate atomic energy development, it would appear that 14 States—Arkansas, Connecticut, Florida, Georgia, Kentucky, Maine, Massachusetts, New Hampshire, New York, Ohio, Rhode Island, South Carolina, Tennessee, and Washington—have taken this step. To our knowledge, similar legislation was being considered by the legislatures of the States of California, Hawaii, Michigan, Missouri, Nebraska, and North Carolina as of early this month. Unfortunately our information does not indicate that the legislatures of others still in session had, or did not have, this matter under consideration.

Concerning comprehensive regulations relating to radiation hazards to workers and the general public, there would appear to be at least 11 States that have adopted such regulations—California, Connecticut, Delaware, Maine, Massachusetts, Michigan, Minnesota, New Jersey, Pennsylvania, Texas, and Wyoming. In six other States, such regulations were in process. These States are Colorado, Hawaii, Kentucky, New Mexico, Oregon, and Texas. Legislation to authorize an appropriate State agency to issue comprehensive regulations was being considered by a number of States as of earlier this month. It should be added that at least an additional five States—Alaska, Illinois, Kansas, North Dakota, and South Dakota require the registration of radiation sources.

Mr. Chairman, as I indicated earlier, in February of this year the Council made certain suggestions to insure that workers exposed to radiation hazards would be covered by State workmen's compensation laws. With respect to what States may have done in this area, our information is extremely fragmentary, I am sorry to say. However, we do know that in Iowa and Montana amendments were enacted to

include radiation as one of the diseases covered by workmen's compensation. We know, also, that the time limit for filing a claim for workmen's compensation was liberalized by legislation enacted this year in Kansas, Texas and Washington, and bills to broaden coverage along the suggested lines were introduced in various other States.

One final word on the draft bill before you, we are aware of the bill which would give primary responsibility with respect to protection of the public health from radiation hazards to the U.S. Public Health Service and local health authorities. As an agency of the States, we feel it would be inappropriate for us to comment on how responsibility at the Federal level should be allocated. This we regard as essentially a Federal question. We do feel, however, that the proposed Federal-State division of jurisdiction in the draft bill submitted by the AEC will lead to a workable program regardless of how Federal responsibility may be allocated.

In fact, we would urge the necessity of enacting substantive provisions such as those contained in the proposed AEC draft bill on Federal-State relations regardless of the internal administrative pattern which may exist within the Federal Government.

Mr. Chairman, members of the committee, thank you very much for having given me an opportunity to speak on behalf of the Council of State Governments on this matter of surpassing interest to the States.

Representative ASPINALL. Thank you, Mr. Schwan, for a very clear and understandable statement. As I understand the position of the Council of State Governments, they are of the opinion that the States can assume and should assume perhaps more responsibility in this particular field. Is that right?

Mr. SCHWAN. You are entirely right, sir.

Representative ASPINALL. Of course, admitting that it is a new field as far as the States are concerned, and also as far as the Federal Government is concerned, isn't it rather peculiar that in States where the States could have assumed more responsibility in this particular area of operation, that is, in the control operation and policing of the mines, that they have done nothing extraordinary about the authority which they have?

Mr. SCHWAN. It is difficult to determine why legislatures or officials do or do not do anything in particular. I suppose an allusion that Dr. Porterfield made to the dramatization of this peril, that is, radiation hazards, has something to do with it. I have no excuses to make, of course. I think they should do more. I think they will.

Representative ASPINALL. I have been acquainted with the operation of the Council of State Governments for a long time. As a matter of fact, one of the former directors, Mr. Henry Toll is a friend of mine.

Mr. SCHWAN. Yes, sir.

Representative ASPINALL. In the State of Colorado where the apparent danger of mining activities has been known for years, there has been nothing done to take care of any particular danger that arises out of this industry, and apparently there are dangers at the present time.

Mr. SCHWAN. I don't think there is any question about it, sir. I think the States should act. I think the present bill, however, guards

against turning over any authority to the States which will not act.

Representative ASPINALL. Will you repeat that, please?

Mr. SCHWAN. I think the present bill guards against the possibility of turning over any authority to those States which do not act. In other words, the State would have to be prepared to act in this field before an agreement could be made.

Representative ASPINALL. Of course, my particular thought in mind here has to do with an area where the Federal Government has not assumed and undoubtedly will not assume any jurisdiction, and that is in the mining. We have had evidence lately that there are dangers that the States are not taking care of. I just wonder how long it is going to be before the States will assume it. Of course, it is going to cost some money, but after all, it is the usual position that if it costs too much money, then the Federal Government must assume the responsibility if the States are unable to get the money for the necessary operation.

Mr. SCHWAN. I don't believe there is any answer that I can make that will be satisfactory, sir. I would certainly like to see them assume their responsibilty and do more.

Representative ASPINALL. Your reference here to the concurrent jurisdiction leads me to this thought. As a understand it, you would like to have as much concurrent jurisdiction as possible, and you don't want an exact delineation of authority.

Mr. SCHWAN. Frankly, after the discussion a moment ago with the representative of the Department of Health, Education and Welfare, I am not sure what we can get from concurrent jurisdiction. I think we feel generally, sir, that the bill as it has been presented to you would give us an opportunity or would give those States an opportunity to exercise such responsibilities as their capabilities permit, and procedure whereby there could be an examination to determine just what their capabilities are or are not.

Representative ASPINALL. In other words, it is a step in the right direction.

Mr. SCHWAN. Indeed it is, sir.

Representative BATES. I had some questions, but in view of your last statement, I don't see much need in asking them because of the reference to these agreements, concurrent jurisdiction, et cetera. But you will buy the bill as it is now.

Mr. SCHWAN. Indeed we will, sir. We think it is a very fine step.

Representative ASPINALL. If there are no further questions, thank you.

Mr. SCHWAN. Thank you, sir.

Representative ASPINALL. The next witness is Mr. Frank Norton of Texas. I understand that he is not present.

Is there anybody here from Texas speaking for the southern Governors conference? If not, the next witness will be witnesses speaking for the representatives of Governors of some States, and we have with us Raymond I. Rigney, in the room, and Clement Bassett, and Karl Allen and George Kinsman.

Mr. KINSMAN. Mr. Allen could not stay. I am George Kinsman, sir.

Representative ASPINALL. We have a letter here under date of May 18, 1959, from the Honorable Foster Furcolo, Governor of the Commonwealth of Massachusetts. Unless there is objection, it will be

placed in the record at this point. Hearing no objection, it is so ordered.

(The letter referred to follows:)

COMMONWEALTH OF MASSACHUSETTS,
EXECUTIVE DEPARTMENT,
Boston, May 18, 1959.

CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States, Washington, D.C.

DEAR SENATOR ANDERSON: I should like to express my appreciation to you and the members of the committee for your invitation to present to the committee the Massachusetts position on the problem of Federal-State cooperation in the atomic energy field. In a State which is vigorously trying to develop this industry we are greatly interested and concerned.

I have discussed our problems on this subject with our State people and should like to propose to the committee for its consideration a pilot study program to be conducted under the United States Atomic Energy Commission, the United States Public Health Service, the Massachusetts Commission on Atomic Energy, the Department of Public Health and the Department of Labor and Industries. Such a study supported by the Government and the State on a matching funds or service basis could well provide answers to such questions as technical training necessary, size of staff, evaluation procedures, regulations required, registration and licensing procedures, sole and concurrent jurisdiction, State budget requirements and other related topics.

I feel sure such a study would provide a sound, practical basis for legislation to insure progress and protection in atomic energy development.

Very truly yours,

FOSTER FURCOLO.

Representative ASPINALL. I shall call you gentlemen in the order of appearance as I have it here on the witness list. Mr. Rigney speaking for Massachusetts.

STATEMENT OF RAYMOND I. RIGNEY, COORDINATOR OF ATOMIC DEVELOPMENT, COMMONWEALTH OF MASSACHUSETTS

Mr. RIGNEY. Thank you, sir. The statement that I shall present today is given from the viewpoints of those State officials who are faced with these problems on a day to day basis.

A brief summary of the present status of Massachusetts' agencies that are principally concerned with the problems of atomic energy and its development might clarify the basis for the proposal that shall be submitted here to the committee.

The Massachusetts Commission on Atomic Energy consists of six members and the coordinator of atomic development. Now serving as members are Dr. Manson Benedict, of MIT, William A. Krebs, of A.D. Little, John J. Regan of the International Brotherhood of Electrical Workers, Philip Thompson of Nuclear Metals, and Dr. Samuel Levin of MIT. This commission serves as an overall advisory group to the Governor, State legislature, State agencies and the general public. It is a nonregulatory group. It has contributed materially to the success of the development of the atomic energy industry in Massachusetts.

The department of public health has by State law the authority to regulate those aspects of atomic energy which might affect the health and safety of the citizens of the Commonwealth. Currently the department has in the State legislature a bill to expand its authorization to include all forms of ionizing radiation. It has just completed a year and a half study on the State problems concerning atomic

energy and health. It is a vigorous State agency vitally interested in this problem and has available to it outstanding consultants from Harvard and MIT.

The department of labor and industries now has in effect Industrial Code No. 5, Rules and Regulations for the Protection of the Health and Safety of Employees From Occupational Diseases Caused by Ionizing Radiation. This code requires registration of all sources of ionizing radiation in industrial establishments. The department's divisions of industrial safety and occupational hygiene are both devoting attention to the problems of atomic energy.

In addition, several other State agencies have varying degrees of responsibility and interest in this field.

Following receipt of Senator Anderson's letter inviting comment on the subject now before the committee, the Governor directed the Massachusetts Commission on Atomic Energy to consult with the departments of public health and labor and industry and to present to him the State's position on this problem.

A brief summary of the position of the State agencies concerned is that:

1. Amendments to existing legislation is not of emergency nature at this time. More practical study and analysis should take place prior to legislation.

2. Growth of the industry and the number of licenses would indicate that both Federal and State agencies must direct greater attention to this problem.

3. The Federal Bureau of the Budget recommendation as to the primary Federal responsibility are essential to the solution of the problem.

4. The State at the present time with its current budget could not handle the Federal responsibilities as well as the Atomic Energy Commission.

5. Considering the several proposed solutions to this problem thus far advanced, so many practical questions remain unanswered that none seems adequate.

The letter from His Excellency, the Governor——

Representative ASPINALL. This is one that has already been placed in the record.

Mr. RIGNEY. It has already been placed in the record. This contains the proposal.

DEAR SENATOR ANDERSON: I should like to express my appreciation to you and the members of the committee for your invitation to present to the committee the Massachusetts position on the problem of Federal-State cooperation in the atomic energy field. In a State which is vigorously trying to develop this industry we are greatly interested and concerned.

I have discussed our problems on this subject with our State people and should like to propose to the committee for its consideration a pilot study program to be conducted under the U.S. Atomic Energy Commission, the U.S. Public Health Service, the Massachusetts Commission on Atomic Energy, the Department of Public Health, and the Department of Labor and Industries. Such a study supported by the Government and the State on a matching funds or service basis could well provide answers to such questions as technical training necessary, size of staff, evaluation procedures, regulations required, registration and licensing procedures, sole and concurrent jurisdiction, State budget requirements and other related topics.

I feel sure such a study would provide a sound, practical basis for legislation to insure progress and protection in atomic energy development.

Very truly yours,

FOSTER FURCOLO.

Representative ASPINALL. Thank you, Mr. Rigney. Do I understand that it is the position of those whom you represent that there is really no necessity as of this time for the Congress to give attention to H.R. 7214?

Mr. RIGNEY. That is the bill of the Commission?

Representative ASPINALL. Yes.

Mr. RIGNEY. They feel that there should be attention given to the bill but that more investigation and more study should be given to the problem rather than enact the legislation and then proceed to adapt the problem to the legislation.

Representative ASPINALL. The Commission has been considering this matter, as you know, for over 2 years. I have reference to this particular matter.

Mr. RIGNEY. Our State people feel very strongly—I am speaking now with reference to health and safety aspects—that there has not been as effective liaison as there might be between the Atomic Energy Commission and the State agencies concerned.

Representative ASPINALL. Let me ask you this: Whose responsibility is it to see that there is this effective liaison? Is that entirely a responsibility of the Atomic Energy Commission and the Congress, or is it partly the responsibility of the various States?

Mr. RIGNEY. I would say it would be equally the responsibility of each.

Representative ASPINALL. How long has the group whom you represent been studying this particular problem that is involved in H.R. 7214?

Mr. RIGNEY. We have a very wide field to cover, and health and safety aspects are one of them. We have discussed it. But the problem is so complex that with the limited resources available to the State agencies not enough progress has been made.

Representative ASPINALL. Of course, that is the suggestion that I made to the witness who was just before us and who represents a group that has a great deal of opportunity to make a study where the States do not step in and take over some of the jurisdiction. Most certainly the Federal Government cannot be blamed for maintaining a continuing responsibility which naturally came to it because of the military aspect of the question in the first place. Until the States make known to the Congress their position for affirmative legislation, we don't get anything done.

Thank you very much.

The gentleman from Massachusetts.

Representative BATES. Mr. Rigney, I am pleased to have you and your group here. In reference to the reports of the various departments in Massachusetts, I note that there is some comment on the budget aspects of the problem. Isn't it true that under the proposed legislation an agreement would have to be entered into between the Governor of the State and the Federal Government before this would become implemented?

Mr. RIGNEY. That is correct.

Representative BATES. So the mere passage of this bill would provide an opportunity but not a duty on the part of the State to cooperate in this program at this time?

Mr. RIGNEY. Our public health people raised one question on that. I am speaking for them and not the State commission on atomic

energy. They raised the question of preemption of the larger type of installations from the authority of the State under the proposed bill.

Representative BATES. Of course, that would not involve the question which I asked in connection with the budget problems.

Mr. RIGNEY. No.

Representative BATES. That would be another matter altogether. But from the budget aspects of the bill, unless the Governor agrees to enter into an agreement with the Federal Government, there is no cost involved, as far as the bill is concerned.

Mr. RIGNEY. That is right.

Representative BATES. As far as preemption is concerned, that is an altogether different matter. I wonder as I read the report whether you had available the substance of the remarks of the various departments who interpose, apparently, some objections to this legislation so we might consider that background information.

Mr. RIGNEY. I don't have them with me, sir, but I can forward them to you.

Representative BATES. If you feel free to offer them to the committee, we would certainly like to study them and see what particular objections they might have to it. As I see this bill, it is merely an indication that the time has come when the Federal Government must remove some of the controls and it should be done in an orderly process over a period of time as the States become more able to assume these responsibilities. That is the sum and substance of the bill. I would think that there is no time to start that is any better than right now, and particularly when it does not impose an obligation upon the State to act contrary to its own desires. You agree with that statement?

Mr. RIGNEY. Yes, I do.

Representative ASPINALL. The gentleman from Washington.

Representative WESTLAND. Mr. Rigney, it would seem from your brief statement here that the State of Massachusetts has gone quite a way in considering the problems of radiation exposure both to the public and the workmen and the hazards that are involved. Apparently you have gone farther than any other States. Yet it would almost seem by your statement here that you want to deny that forward looking approach to other States in the country which actually, as the gentleman from Massachusetts, Mr. Bates, has mentioned, is what this bill would do. You don't really mean that?

Mr. RIGNEY. Absolutely not to deny to any State any opportunity to develop anything. The point that seemed to be developed by the State agencies was that they have been in the field a relatively short time. The problems of State budget are heavy on their shoulders.

Representative WESTLAND. We have a little budget difficulties here, too.

Mr. RIGNEY. I would not want to deny that, and I am sure they would not deny any opportunity to any State to develop or to progress in this field.

Representative WESTLAND. We have had testimony from the National Association of Attorneys General and testimony from Governor Smylie, who heads the Governors of the country, and they have all

indicated approval of this legislation. Did Massachusetts file a minority report to those statements?

Mr. RIGNEY. My personal responsibility is to coordinate only State agencies as best I can. I don't go up to the level of the Governors' conference or the attorneys general. So I am not familiar with other than the testimony that I have heard here.

Representative WESTLAND. We are constantly told that we must study things more, and believe me, I have been doing a lot of studying since I got on this committee, and I am sure I have a lot more studying to do too, but sometimes action has to be taken, and this is what we are trying to do with this legislation, to delineate this field. I know Massachusetts is a great States rights organization. We want to put this on a footing where the States can handle some of this business. Don't you agree with that?

Mr. RIGNEY. My own personal opinion would be yes. Again replying to you from the point of view of the State agencies, they believe that this has been a Federal problem up to now, and they question whether without seeing spelled out a little more clearly the assistance and help that they might get whether this should be done now.

Representative WESTLAND. Do you think there would be any difficulty in getting assistance from the Atomic Energy Commission?

Mr. RIGNEY. No; absolutely not. I might point out that the Atomic Energy Commission has been extremely helpful and done all that they can with their limited staff. But I also would point out that I feel that the Atomic Energy Commission has not done enough to develop on the local level the interest and support of the State agencies who must handle and face the local populations with their problems day in and day out.

Representative WESTLAND. You mentioned that there could be better liaison with the Atomic Energy Commission.

Mr. RIGNEY. Yes.

Representative WESTLAND. Could you be a little more specific than that, Mr. Rigney? Do you have any examples?

Mr. RIGNEY. I think that there ought to be a closer contact between the various divisions of the Atomic Energy Commission. If, for example, we in the State level have a particular question, if we had a focal point in the AEC which we could contact, I think problems which develop, for example, in the city of Boston over some of our disposal questions, could be handled better. The State Commission on Atomic Energy does not have the staff to adequately handle the public relations problems that develop in such a case.

Representative WESTLAND. That certainly is a problem too. We recognize that.

Mr. RIGNEY. I think that if the Atomic Energy Commission had a larger staff of liaison that it could better develop the States themselves to handle it.

Representative WESTLAND. The gentleman from Colorado, the acting chairman of this committee, has presented the question of who goes to whom. You have a fountainhead of information on these subjects here in Washington in the AEC. Is it possible for you to communicate with them regularly when you have problems in your community?

Mr. RIGNEY. No. I think as I have said, we have communicated with them and had excellent cooperation. I think there should be more of it. The skeleton is there. To flesh it out, I think, is the problem.

Representative WESTLAND. It would be pretty difficult for the Atomic Energy Commission to have representatives in every State to be advisers on all facets of radiation hazards. There are many other problems that are presented. I am not certain just as to the number of employees in the Atomic Energy Commission, at the present time, but I think it is something like 6,000. This presents a real problem, Mr. Rigney. If you have any suggestions, we would be glad to get them.

Mr. RIGNEY. Of the 6,000 total employees, I wonder is the number for inspection a large percentage. What percentage of that is for inspection? What percentage of that is for the other sections that a State might contact directly, aside from contracting and so forth.

Representative WESTLAND. I take it in the final analysis you are not opposed to this legislation?

Mr. RIGNEY. No.

Representative WESTLAND. You believe that a continuing study should be made on Federal-State relationships in this field.

Mr. RIGNEY. Yes, sir.

Representative ASPINALL. Mr. Bassett, do you have a prepared statement?

STATEMENT OF CLEMENT R. BASSETT, ASSISTANT ATTORNEY GENERAL OF WEST VIRGINIA, REPRESENTING GOVERNOR UNDERWOOD

Mr. BASSETT. Mr. Chairman and members of the Joint Committee, I do not have a prepared formal statement.

Representative ASPINALL. The committee will have to close these hearings very shortly, so will you make it as brief as you can?

Mr. BASSETT. My name is Clement Bassett, Assistant Attorney General, representing Governor Underwood of the State of West Virginia.

The State of West Virginia, as noted before, has no formal statement to offer, and the State of West Virginia takes no position, and likewise has no recommendations. That is not to say, however, that we do not have a deep interest in the proceedings now before the Joint Committee.

Our State is represented on the Regional Advisory Council of the Southern Governors' Conference. We do believe that on the basis of information presented at these hearings on Federal-State relationships and cooperation in the atomic energy field, a program of mutual benefit to all parties concerned should and will be developed.

On behalf of the Governor of the State of West Virginia, Cecil H. Underwood, I want to thank this honorable Joint Committee for your kind invitation to participate.

Representative ASPINALL. Thank you, Mr. Bassett.

Mr. Kinsman, representing the State of Florida.

STATEMENT OF GEORGE KINSMAN, MEMBER OF THE FLORIDA NUCLEAR COMMISSION

Mr. KINSMAN. My name is George Kinsman, Mr. Chairman. I am a member of the Florida Nuclear Commission and I have been asked to represent that body here today.

In Florida we are very much in favor of the principle behind this legislation, particularly this new bill, H.R. 7414. Like Dr. Porterfield, we have some reservations in regard to section 1, the so-called recapture clause, which we think is not essential to the intent and to the purposes of the bill. As a matter of interest, I might say that our legislature is now in session and our State department of health has introduced a bill in both Florida houses on the subject of radiation protection which is patterned after the recommendations of the U.S. Public Health Service.

Insofar as the specific wording of H.R. 7214 is concerned, as I said, we would prefer to see it without the recapture clause.

Personally and on behalf of the State, I think we would like to see something a good deal simplier, such as the bills which were prepared by Mr. Durham in 1956 and Mr. Anderson in 1957, both of which are contained in this green book, as being broad and simple and not trying to get into too much detail as we go along in this new field. In other words, we would prefer to see something more general and not quite as specific. But we are in favor of this legislation.

Representative ASPINALL. What you are saying, are you not, is that you are agreeing with those who are taking the position that you would desire legislation that would permit concurrent jurisdiction because that is what happens whenever you have a broad bill. When, with the passage of time, you get down to specifics then you divide the responsibility. So your position is that we are not far enough along to begin to get down to the particular areas of sole jurisdiction?

Mr. KINSMAN. Perhaps I did not make myself clear, Mr. Chairman. I do not believe in concurrent jurisdiction. I think it should be divided jurisdiction. As I understood the bills represented in the past by Mr. Durham and Mr. Anderson there would be contract arrangements between the AEC and the States setting forth exactly what the responsibilities of each would be, with a very fine line.

Representative ASPINALL. As I understand the Commission's position at the present time, they contend that their proposal now is similar to the Durham and Anderson bills of 1956 and 1957, but that with the passage of time they have learned certain things where perhaps there should be some changes made.

Mr. KINSMAN. We won't quarrel with that, sir. We are in favor of this legislation as it stands. As I said we have some reservations about the recapture clause. I think that completes my statement, sir.

Representative ASPINALL. Thank you very much. Our counsel, Mr. Toll, has a question.

Mr. TOLL. I think it might be pointed out for the record that I believe Florida was the first State or one of the first states to appropriate moneys at the State level for atomic energy development. Isn't that correct?

Mr. KINSMAN. That is correct, Mr. Toll. Our Nuclear Commission has been in office several years. We had some good news today

that the current legislature has approved our appropriation for the next biennium.

Mr. TOLL. Florida has been very forward looking in wanting to assume its responsibilities in this field.

Mr. KINSMAN. Thank you.

Representative ASPINALL. Thank you very much.

Has Mr. Norton of Texas made his appearance in the room as yet? Apparently not.

The committee will stand adjourned until 10 a.m., tomorrow in room F–39 of the Capitol.

(Thereupon at 3:30 p.m., Thursday, May 21, 1959, the committee recessed to reconvene in room F–39, the Capitol, at 10 a.m., Friday, May 22, 1959.)

FEDERAL-STATE RELATIONSHIPS IN THE ATOMIC ENERGY FIELD

FRIDAY, MAY 22, 1959

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D.C.

The committee met, pursuant to recess, at 10 a.m., in room P–39, the Capitol, Representative Chet Holifield presiding.

Present: Representative Holifield; Senator Aiken.

Also present: James T. Ramey, executive director; David R. Toll, staff counsel, Joint Committee on Atomic Energy.

Representative HOLIFIELD. The committee will be in order.

The Joint Committee on Atomic Energy is meeting this morning to continue its public hearings on Federal-State Relationships.

Yesterday we received testimony from representatives of the AEC, the U.S. Public Health Service, and various States concerning the bill proposed by AEC with respect to cooperation with States.

Our first witness this morning is Mr. John Curran, representing the AFL–CIO. We are glad to have you with us this morning, Mr. Curran. Please proceed.

STATEMENT OF JOHN CURRAN, LEGISLATIVE REPRESENTATIVE, DEPARTMENT OF LEGISLATION, AFL–CIO, ACCOMPANIED BY GEORGE TAYLOR, RESEARCH DEPARTMENT, AFL–CIO

Mr. CURRAN. Thank you, Mr. Chairman.

I must apologize for Mr. Andrew J. Biemiller, who is unable to be here this morning. He has been detained on some other business, and he has asked me to present this statement.

My name is John Curran. I am legislative representative of the Department of Legislation of the American Federation of Labor and Congress of Industrial Organization. I have here with me Mr. George Taylor, from the Research Department of the AFL–CIO, who is also the secretary of the staff subcommittee on atomic energy of the AFL–CIO.

I am happy to have this opportunity to present the views of the AFL–CIO on the matter of Federal-State relationships in the field of atomic energy development.

At the outset, I should like to make clear the basic position taken by the AFL–CIO Executive Council last February on the question now before your committee, particularly as it involves employee radiation hazards and workmen's compensation. The Executive Council policy statement just referred to has been made part of the record of two previous hearings held this year before the Joint Committee

on development, state and growth of the atomic energy industry, and before the Subcommittee on Research and Development, dealing with employee radiations and workmen's compensation.

The Joint Committee on Atomic Energy and the Congress were urged by the AFL–CIO Executive Council's policy statement to—

(1) reaffirm and reinforce the system of Federal responsibility for radiation hazard control; and

(2) adopt a Federal program of workmen's compensation for workers subject to radiation hazards.

The position of the AFL-CIO that the major responsibility of radiation hazard control and workmen's compensation should be retained by the Federal Government is strong and unmistakable. We oppose any dilution of this responsibility by farming it out to the States.

The expansion of the peaceful uses of atomic energy in the United States is proceeding at a rapid rate. There is every likelihood that it will continue.

Since the organic Atomic Energy Act became law in 1946, the Federal Government has occupied the dominant position in the atomic energy field, including peacetime uses.

The 1954 amendments to the 1946 act made possible increased participation by private industry in developing expanded uses from the atom for peaceful purposes. Congress, however, has continued to repose in the hands of the Federal Government responsibility over standards, rules and regulations governing the licensing of nongovernmental entities using fissionable materials for industrial, medical, and other purposes. The Federal Government continues to retain the power over standards and regulations governing the safe use of fissionable materials by both licensees and contractors carrying out various enterprises on behalf of the Atomic Energy Commission.

Under the 1954 act, the Atomic Energy Commission controls atomic fuels, utilization and production facilities and their operators, byproduct materials, patents and various classified data.

Congress has given the AEC responsibility for expanding the development and use of atomic energy, and at the same time it is the repository of authority to regulate its own and its contractors' and licensees' operations with respect to health and safety standards, with the aim that workers individually and collectively, and the public at large, be fully protected from radiation hazards.

Congress, however, has not placed in the hands of the Commission power to regulate use of such naturally recurring radioactive sources as radium, X-rays, or radioactive isotopes from accelerators except in the case of materials controlled by the Commission.

The Commission itself has not chosen to exert control over transport or storage of radioactive materials in interstate commerce. While it does issue licenses to mining concerns governing possession and transfer of source materials, the Commission exercises no regulatory power over actual mining operations.

Other public and quasi-public agencies directly concerned with radiation include the National Committee on Radiation Protection, the Public Health Service, and the Food and Drug Administration of the Department of Health, Education, and Welfare, the Bureau of Mines, the Department of Defense, the Interstate Commerce Com-

mission, the Post Office Department, and the U.S. Coast Guard, and the various State governments.

Representative HOLIFIELD. At that point let me interrupt you to comment on this, and ask you a question or two. You rightly say the Commission issues the licenses to mining concerns governing possession and transfer of source materials. The Commission exercises no regulatory powers over mining operations. This is true. The Bureau of Mines is the department of government which is charged with the responsibility of protecting the life and health of the miners in the mines. What do you envisage here? Do you envisage putting the uranium ore mines under the Commission and charging the Commission with responsibility for this regulation, or do you contemplate an increase in the Bureau of Mines or some other State agencies that would be under the control of the States, such as the State public health bureau? What is your point in this?

Mr. CURRAN. The point was that there should be a closer working relationship, Mr. Chairman, between the Bureau and the AEC in the enforcement of safety standards.

Representative HOLIFIELD. Has there been any lack of cooperation on the part of the Atomic Energy Commission in furnishing health information to the Bureau of Mines? Has there been any request of the Bureau of Mines for radiation information which has been refused?

Mr. CURRAN. Let me ask my expert in the Research Department on that, Mr. Chairman.

Mr. TAYLOR. Mr. Chairman, according to all the information that we have been able to obtain from testimony in some of the hearings here, but particularly the one which took place, I think, under your chairmanship, in the subcommittee, in March, that testimony by some of our people indicated that there was definitely a quite high exposure of radon gas to workers in many of the uranium mines in Colorado and New Mexico.

Representative HOLIFIELD. I would concede that.

Mr. TAYLOR. Which indicates to us that there must be some lack either by the Bureau of Mines in enforcement of safety standards, or the application of safety standards which might have been promulgated in arrangements with AEC and the Bureau of Mines in carrying out the safety programs within those mines.

Representative HOLIFIELD. The primary responsibility for safety conditions in the mines is placed by the Federal statute on the Bureau of Mines. The Bureau of Mines has certain cooperative arrangements with the States. The fact that the ore that is mined in these mines is eventually bought by the Atomic Energy Commission has very little to do with this factor of responsibility for the health in the mines. This is what I want to know. I want to know if you are advocating that the law be changed so that the AEC becomes responsible for mining operations, or whether your complaint is that the Bureau of Mines is not doing its duty under the law.

Mr. TAYLOR. A little further along in our testimony we make certain legislative recommendations. It might be possible if you want to defer that question until you have had a chance to look that over, it may make our position clear. If it does not, we will answer any questions.

Representative HOLIFIELD. That is fine.

Mr. TOLL. I think perhaps the basic problem here is who has the responsibility for inspection and enforcement. I don't believe the Bureau of Mines has that sort of job. The only people who do have that responsibility at the present time are your State public health officers. A representative from the Colorado State Department of Health testified before this committee a day or two ago and indicated that the situation was not very well under control. They frankly admitted this. The question is who should have the responsibility for inspection and enforcement in your view. Perhaps you might answer that.

Mr. CURRAN. As Mr. Taylor mentioned before, later on in our testimony we come out with certain recommendations which I think will encompass your question.

Mr. TAYLOR. If you don't mind, I would just like to say a couple of words on that, although I don't want to take too much time of the committee. I do come from a Western State. My own family has been engaged in the mining business for some time. As you all know, particularly in the Western States where uranium is being mined right now, they generally have a State mine inspector who is responsible for carrying out functions with respect to conditions of safety, and so forth and so on. In my State of Idaho, the mining inspector usually cooperates with the public health department. Nevertheless, his office is responsible for maintaining safety standards.

Representative HOLIFIELD. That is a State office.

Mr. TAYLOR. That is a State function. In carrying this back to our basic position that the States are not at least right now in a position to undertake setting standards of safety in the field of radiation, my own personal knowledge of two or three of them is that the States certainly should not be given this power because in many cases the standards are not adequately enforced.

Representative HOLIFIELD. Yet we have a very strong movement on the part of the Governors of the States at their conference and so forth to turn as much as possible of this regulating power over to the States. We have this testimony before us.

Mr. TAYLOR. That is right.

Representative HOLIFIELD. On the other hand, we have the testimony that the States are not doing their job properly in this field.

Mr. TAYLOR. I think in any hearing like this you are going to have divergent views on this both from the standpoint of the natural jealousy of the States to reserve their implied and reserved powers under the Constitution, and also from the standpoint of the feeling that this is a national situation. Radiation is no respecter of State boundaries and involves in unseen fashion the lives of everyone in and out of mines and industrial plants. You do have a basic clash.

Representative HOLIFIELD. Are you aware of any State that is doing a good job, or do you have any knowledge on the subject?

Mr. TAYLOR. To my best belief and knowledge, the State of New York has gone further than most of the other States. California, I understand, has the beginnings of a program which in some respects has standards tighter than the NCRP standards on certain types of tolerable levels of dosage. These are exceptions rather than the rule, as far as my understanding of the situation is concerned.

Mr. TOLL. There should be a uniformity of standards, but it is the availability of persons to do the inspection and enforcement jobs that is the important thing.

Mr. TAYLOR. That is right.

Mr. TOLL. Somebody has to do this job either at the State or Federal level.

Mr. TAYLOR. That is the basic problem.

Representative HOLIFIELD. Proceed, Mr. Curran.

Mr. CURRAN. The basic questions raised by the present hearings are these, and they apply both to the problems of adequate protection from the radiation hazards and workmen's compensation for injuries arising out of overexposure to radiation:

1. Should the Federal Government do more in both fields than it is now doing, and, if so, how best can this be accomplished?

2. Can the various State governments do more than they are doing, and should they be allowed by modification of the Atomic Energy Act of 1954, as proposed by the Commission's instant legislation, to assume gradually the major role in radiation health and safety?

We take the firm position that it is desirable for the Federal Government to assume not less but more responsibility for protection of workers and the general public from radiation hazards. Our position is, we believe, sound, both from the standpoint of policy and of constitutionality.

The Atomic Energy Commission called a conference of representatives of various States in 1955, the first meeting taking place in February 1956. It was followed by the establishment of the Civilian Panel on Impact of the Peaceful Uses of Atomic Energy (McKinney Panel), which released its report in 1956.

The conclusions of the so-called McKinney Panel on State-Federal relationships in the field of atomic health and safety were ambiguous. From them it is difficult to determined if the Panel supported the view that the States should be given the powers in this field only as allowed by AEC, or if they should do whatever they wanted to do.

AEC concurred in this two-headed recommendation, which left the situation just as it was before—with Congress not taking action to this day to establish the nature and extent of its responsibility, the Commission taking no clear-cut position, and the States acting not at all, or enacting some regulations in scattered instances.

In December 1957, the Joint Federal-State Action Committee recommended that the 1954 act be amended "to clarify the roles of the Federal-State Governments, to make possible the assumption of greater responsibilities of the States in the future promotion and regulation of the peacetime uses of atomic energy." Bills to accomplish this aim had already been introduced by former chairman Representative Durham in 1956 and by Senator Anderson, the present chairman, early in 1957. The Commission's proposed legislation was submitted to the Joint Committee in June 1957.

In his testimony before the Joint Committee on May 19, Mr. John S. Graham, member of the Commission, stated that the recently introduced Commission legislation on Federal-State relationships has adopted

the basic approach to this problem which was incorporated in Senator Anderson's and Congressman Durham's bills, although there are differences in procedures and the provisions of our proposed bill are considerably more detailed.

In attempting to reconcile the legislative intent of both the Durham and Anderson bills, the Commission has emerged with a hybrid which would result in administrative confusion, further intensify Federal-State conflict on respective areas of responsibility, and provide little, if any, assurance that radiation health and safety standards would be adequate in themselves, or adequately enforced.

This bill leaves unanswered the question of the area of responsibility for control of radiation hazards not already under jurisdiction of the Commission—from X-ray machines, particle accelerators and radium, for example—and these constitute the major sources of man-made radiation.

This legislation might be termed a decompression chamber to enable the Federal Government to escape necessary responsibilities in a field vitally important to every citizen.

In our opinion, the proper amendments to the act should accomplish the following:

1. Assumption of full Federal responsibility for health and safety programs in the field of atomic energy, with such aid that the various States can and are willing to provide in inspection, education and enforcement, preferably in some kind of a central agency. Special emphasis should be given to close cooperation with the States in radiation waste disposal, local site and safety matters and intrastate commerce.

2. In connection with assumption of such Federal responsibility, Congress should clearly define the working relationships between the Federal and State Governments, but never to the extent of giving the States the power to determine maximum radiation exposure levels.

The Commission's proposed bill submitted to the Joint Committee would strip the Commission, State by State, of its power to formulate uniform standards of permissible radiation exposure levels, and see to it that they are enforced. Amended subsection g of section 274 of the 1954 act merely calls upon the Commission to "cooperate with the states in the formulation of standards of protection against hazards of radiation," and that the Commission "coordinate Federal and State radiation protection programs; and that there be reasonable compatibility among the various Federal and State programs."

In view of Commissioner Graham's statement that the purposes of this bill have been adjusted by the Bureau of the Budget that this legislation is in accord with the President's program, it can be readily determined from the words of Mr. Graham and our experience with this administration's approach to national economic problems—unemployment compensation, Federal aid to education, distressed areas assistance programs, housing, pollution control, resources development and others—is to turn them over to the States, a position consistently opposed by the AFL–CIO.

If there is a concerted desire and ability shown by the various States to assume adequate responsibiilty over the health and safety, and workmen's compensation aspects of the atomic energy field, we have not observed it in our close following of legislatures in every State.

The mere fact that such enabling legislation as that now proposed by the Commission might be enacted into law would not provide any assurance that the States would be induced to take stronger legisla-

tive measure to establish adequate radiation safety and workmen's compensation programs. The fact that they do not bother to control radiation hazards from X-ray machines—the largest manmade radiation source—and which is not under the Commission's jurisdiction, is one clear indication that there is not a great deal, if anything, constructive that can be expected to come out of such a bill as is now before the committee.

It is our belief that the Joint Committee and the Congress should consider legislation which would first of all establish a sound, overall Federal program dealing with radiation health and safety, with adequate enforceable standards which protect workers and the general public, and which places the program itself into the hands of a Federal agency which is not both a promoter of the peaceful uses of the atom and the promulgator and enforcer.

We believe that such legislation should by all means cover all natural and manmade sources of radiation, including nuclear fallout, and that it should plainly state that the Federal Government has constitutionally preempted the entire field.

Sound legislation establishing the jurisdiction and policymaking power to be held and exercised by the Federal Government with necessary administrative reorganization to achieve this purpose should enable States to establish their own programs for local enforcement, educational, and inspection purposes in cooperation with the central Federal agency. We believe in any case that the Department of Health, Education, and Welfare, through the Public Health Service and Food and Drug Administration should have authority over health and safety programs in the atomic energy field.

Representative HOLIFIELD. On that point, I think from a theoretical standpoint I might be in accord with what you have advocated. That is, that there be a central agency which would have jurisdiction and regulatory power over all forms of mandmade radiation. However, in this world we have to look at certain practical things. Among those practical things we have to look at is the division of State and Federal power. As you know, this is a very controversial ground politically between those who believe that any effort to strengthen a centralized Federal type of government is bad, and any effort to delegate responsibility by the Federal Government to the States is good. So you run into that situation.

Another situation which you run into is the ability to get appropriations by civil departments such as Health, Education, and Welfare. I am sure you are aware of the amount of money that has been allocated to them to do work in this field. In round numbers, I would say there is approximately $600,000 for the past fiscal year, if I recall correctly, and in this field of radiation detection, monitoring, and evaluation, the appropriations for the AEC has been close to $20 million, and in the Department of Defense close to $38 million. If we look at those comparative appropriations, and after all, it comes down to the dollar that you have to work with, what would become of your recommendation from a practical standpoint if the present Commission control over radiation was transferred bodily to the Department of Health, Education, and Welfare and the Public Health Service, and the Food and Drug Administration given the authority? How many dollars do you think they would get to do the job?

Mr. CURRAN. If you are going to move one group from the AEC to the Public Health Service, it would seem to me you would have to move the money with them. You could not leave the money with the AEC.

Representative HOLIFIELD. You have been here in Washington a long time. We are talking about moving the responsibility over. After the responsibility is moved over, let us talk about moving the tools over to get the job done. Do you think that the Public Health Service would be given anything near $20 million to work with in this field of radiation?

Mr. CURRAN. I think if the drive were made, Mr. Chairman, to educate or to inform the Congress of the importance of this agency carrying on a program which up to this point has been under the supervision of the Atomic Energy Commission, we might establish a better chance of getting sufficient funds. We certainly in the AFL–CIO would do everything in our power to try to bring this message to Congress and support such an appropriation so that they could carry on an effective program.

Representative HOLIFIELD. It is possible that an educational job can be done on the Congress. I have been trying to do it on civil defense now for about 5 years, and I have not made much headway.

Mr. CURRAN. I think that when you do state your position, Mr. Chairman, you do convince additional people.

Representative HOLIFIELD. You may proceed.

Mr. CURRAN. We recommend that the whole role of the National Committee on Radiation Protection be thoroughly reexamined by the Joint Committee and the Congress on the basis of its quasi-public nature, coupled with its decisive influence, with no public controls over the establishment of safe levels of radiation exposure to the people of America. It should either be fully a Federal agency or a Federal agency should take its place.

To act on the Commission's legislation under the circumstances would be, to put it mildly, premature, and the reasons for its being so are not only inherent in the content of the Commission bill, but by the existing situation both federalwise and statewise. Neither arm of government is ready to consider maturely substantive legislation in this field of atomic energy.

In our March 18, 1959, testimony, I outlined the various reasons why the State government should not be given the power to control health and safety programs connected with radiation. I also stated two major reasons why Federal control should be maintained and strengthened.

The State weaknesses I listed were:

1. State governments react slowly and unevenly to new needs requiring their action. Standards governing safe use of fissionable materials in industry will be subject to modification as more scientific and medical knowledge is brought to bear on the problem.

Labor has had long experience in dealing with the variance in State workmen's compensation laws and regulations, as well as other States administered programs affecting workers. We have found distressingly slow State reflexes to new conditions demanding better administered programs.

Our experience, with all of the variations in protection offered workers against injuries on the job, with the amount of compensation,

with standards, with rules and regulations, can only bring us to conclude most forcefully that we cannot and must not intrust to the States this most vital aspect of the peaceful uses of atomic power as it affects the health and safety of workers.

2. Handing over to the States the Federal powers over radiation safety would so weaken the programs controlling radiation hazards "as to jeopardize public confidence in their controllability with a resulting loss of worker and public confidence and a growth of a fear of radiation which can seriously impede all atomic progress." (The last is taken from the statement on radiation hazards and workmen's compensation adopted by the AFL–CIO Executive Council last month.)

3. An adequate health and safety program requires both money and a well-trained staff. Staff to deal with this new aspect in our industrial life is in extremely short supply. To establish duplicating Federal and State radiation safety programs would merely make the supply of trained personnel in this field even more nearly stretched to the breaking point, with many of these technicians performing duplicating and overlapping functions.

4. Since monitoring is a major key to an adequate safety program, individual exposure records should be kept and data reported uniformly to a central agency where the records are kept and analyzed. Thus, it is easy to see that a Federal entity should have the responsibility for gathering such data and providing for nationwide reporting.

5. Standards on permissible maximum safe radiation doses of individuals vary to some degree between those proposed by the National Committee on Radiation Protection and those employed by the AEC. Other combinations of variation exist between the States, between the States and the NCRP. There are also, unfortunately, complicating and differing safety practices by the AEC among its own plants. That is why there should be a single minimum Federal standard, administered nationwide, and capable of being modified toward a greater degree of protection to workers under the impact of new knowledge.

Change in industrial safety equipment requires a sufficiently long period of time to meet new standards of maximum dosage of employees. But this period could be prolonged beyond all necessity by lax and differing State regulations.

The reason for Federal desirability were:

1. There is already in being a Federal safety program, with Federal standards and a Federal licensing system, governing uses of radioactive materials. Federal agencies with experience in the health and safety field must be given the full authority and necessary resources to develop and enforce effective radiation control programs, covering all industries using radioactive materials.

2. Most States and localities simply do not now, nor are they likely in the future to possess, as the AFL–CIO statement on radiation hazards and workmen's compensation states, "necessary financial or personnel resources of the continuing interest and attention required for effective radiation control programs."

On behalf of the AFL–CIO, I appreciate the opportunity of presenting our views to the Joint Committee. With scores of thousands of workers already involved in jobs connected with fissionable materials, and thousands more added every year, we have a direct interest in this whole basic issue now before your committee. And even on a broader basis, as citizens as well as workers, laboring people and

their families must with their fellow citizens be assured that health and safety from radiation hazards must be adequately established. This can only come from the kind of Federal program and Federal standards that provide protection strongly and uniformly, and not varying from State to State.

Representative HOLIFIELD. Thank you, Mr. Curran, for a very thoughtful statement. Your statement is challenging and you bring out some very good points. You have pretty strongly indicted the present Commission draft of legislation in this field. Have you made a section by section analysis of the bill?

Mr. CURRAN. Just in rough draft, Mr. Chairman. We would be glad to furnish the committee with a copy of our section by section analysis if that is the desire of the Chairman.

Representative HOLIFIELD. It is the desire of the Chairman. We would like to have your analysis of the bill and your suggestions as to how the bill can be improved.

Mr. CURRAN. We would be very happy to do that, Mr. Chairman.

(The analysis referred to follows:)

The following material is submitted for the record of the above hearings conducted by the Joint Committee on Atomic Energy as requested by acting chairman, Representative Chet Holifield:

STATE-FEDERAL RELATIONSHIPS LEGISLATION

WHAT THE COMMISSION BILL WOULD DO

H.R. 7214 and S. 1987, identical bills, add a new section to the Atomic Energy Act of 1954. This section would divest the Atomic Energy Commission of certain regulatory and licensing authority in protection of the public from radiation hazards and transfer it to the various State governments.

1. What authority would pass to the States?

The States would be empowered to assume licensing and regulatory functions governing potential radiation hazards, created by the "ownership, possession, use, transfer, delivery, receipt, and disposal" of byproduct material, special, noncritical nucelar material, and source material.

2. What authority would be retained by the Commission?

(*a*) Activities connected with a Commission-licensed production or utilization facility.

(*b*) Export or import into the United States of source, special nuclear or byproduct material, or any production or utilization facility.

(*c*) Nuclear waste disposal into the ocean.

(*d*) Other disposal of nuclear waste from byproduct, special, or source material determined as necessary to have a Commission license.

(*e*) Sale or transfer by the various elements of the private nuclear industry, of equipment, devices, products, etc., containing source, byproducts or special nuclear material.

(*f*) Activities of the Commission to protect the common defense.

3. What procedures are established for the State to take over AEC licensing and regulatory functions?

The Commission is authorized by this legislation to enter into agreements with the Governor of any State providing for discontinuation by the Commission for any or all of the various categories of activities affecting public health and safety from radiation hazards listed in (2) above.

While such agreements are in effect, the State is the sovereign authority over regulation and licensing of activities in atomic development for peaceful purposes to protect public health and safety.

The Commission may enter such an agreement with a State if:

(*a*) The Governor certifies that the State has a radiation control program adequate to protect health and safety in the activities covered by the agreement.

(*b*) The Commission finds that the State has an adequate program "compatible" with that of the Commission in the field of radiation hazard control.

(*c*) The proposed agreement is published once a week for 3 weeks in the Federal Register in order that interested persons may have an opportunity to comment.

4. How the agreement would work

(*d*) The agreement, once in force, shall show the date on which it is to become in operation.

1. In such an agreement, the Commission is authorized to grant such exemptions from the licensing requirements contained in the 1954 act considered "necessary or appropriate" to carry out the intent of this legislation and any agreement under its provisions.

(*e*) The Commission is "authorized and directed" to cooperate with the States in establishing standards for protection against radiation hazards to assure that Commission and State programs will, "to the extent feasible, be coordinated and compatible."

(*f*) The Commission is authorized to enter into cooperative agreements with a State or a group of States to perform inspections or other appropriate activities. The Commission is also authorized to undertake training of employees of a State or political subdivision of the State, or of a group of States, "with or without charge."

5. How can the Commission or the State end the agreement?

The Commission can suspend or terminate any such agreement as outlined above. The condition of suspension or termination would be a Commission finding that it was necessary to "protect the public health and safety" if the Commission did it on its own initiative, or the Commission's acting to terminate or suspend the agreement on request of the Governor of the State. In the latter instance, the Commission would thereupon reassert its original authority.

ANALYSIS OF S. 1987 AND H.R. 7214

The fundamental opposition of the American Federation of Labor and Congress of Industrial Organizations to H.R. 7214 and S. 1987 is over the policy embodied in this legislation.

Since the AFL–CIO strongly believes that the Federal Government should and must maintain control over radiation health and safety programs in the field of peaceful atomic energy development, the instant legislation proposed by the Commission now before the Joint Committee on Atomic Energy is totally unacceptable policywise. Therefore, we do not regard it as susceptible of amendment and, instead, will propose alternative legislation as a substitute for H.R. 7214 and S. 1987 to the Joint Committee for its consideration.

However, we do take this opportunity to bring to your attention these broad objections to the Commission's proposed legislation:

1. It provides for total relinquishment of the Commission's present constitutionally based authority to regulate and license the categories now proposed to be divested from control of the Federal Government under Federal-State agreements. The categories of activities which would be relinquished by the Commission under this legislation are those which are of the most vital concern to scores of thousands of workers now and to many thousands more in the future as the industry expands. Even though there are provisions for the Commission to abrogate agreements with States in the event the State does not meet this provision, the standards underlying such agreements are drawn with such looseness and with so many options and exceptions, that a State would have to be singularly remiss before the Commission would be justified under the proposed legislation in taking action.

2. The legislation still fails to provide for minimum Federal health and safety standards governing exposure to ionizing radiation being unequivocably met by the States as a primary condition of a plan acceptable to the Commission. Subsection g merely authorizes and directs the Commission to cooperate with the States to formulate their own standards so that they will be "to the extent feasible * * * coordinated and compatible." This language would, in effect, rule out uniform minimum standards nationwide which the AFL–CIO most strongly feels is the fundamental prerequisite of an effective health and safety program in the area of radiation hazards.

3. The proposed bill retains the Commission's undesirable role of simultaneously promoting rapid expansion of the atomic energy industry and regulating health and safety programs to the extent remaining if this legislation becomes law.

4. The bill does not address itself to the most important sources of man-made radiation X-rays, fallout from nuclear weapons testing, uranium mines, particle accelerators, etc., none of which are presently under the jurisiction of the Commission, nor any provision being made that certain of these sources be controlled by State programs as a condition of approval of the Federal-State agreement by the Commission.

5. In no place in Commission's proposed legislation is there any effort to spell out the administrative relationships between the Commission and other Federal agencies with health and safety responsibilities affected by the development of the nuclear industry—Public Health Service, Interstate Commerce Commission, Coast Guard, Food and Drug Administration, Department of Commerce, Bureau of Mines, to name the principal ones. It is our understanding that the Bureau of the Budget is now conducting a study relative to assessing the roles of these agencies with respect to protection of the public against radiation hazards. Certainly, it would be premature to act on any kind of legislation redefining the respective roles of Federal Government and those of the States until the Bureau of the Budget has released its report and recommendations which would, we assume, be submitted to Congress for consideration, and very possibly would propose certain administrative changes in the areas of responsibility now occupied by the Commission.

6. Nothing is mentioned in the instant legislation about the future role of the National Committee on Radiation Protection. This quasi-public committee is not responsible to the public, nor to any arm of the Federal Government, yet it is the instrumentality which establishes the standards used with little modification by the Commission for its own radiation health and safety programs in AEC facilities, in work performed by its contractors, and in setting the conditions governing issuance of licenses to user of fissionable material.

These are our major objections to H.R. 7214 and S. 1987. As we stated in our testimony before the Joint Committee on May 22, the Commission's legislative proposals would "result in administrative confusion, further intensify Federal-State conflict on respective areas of responsibility, and provide little, if any, assurance that radiation health and safety standards would be adequate in themselves or adequately enforced."

We see no assurance by means of this legislation that the States would be induced to take stronger legislative measures than they are now doing to establish stronger radiation health and safety programs. Thus, our long-held opinion is only reinforced that the Congress should provide legislation which would first of all establish a sound, overall Federal program dealing with radiation health and safety, with standards which protect workers and the general public. Such legislation should enable States to have their own programs approved if they meet or exceed Federal uniform standards and deal in local enforcement, educational and inspection programs in cooperation with the Federal Government.

Mr. TOLL. Mr. Curran, I wonder, on the job of inspection and enforcement again, how many Federal inspectors you would have to have to carry out this program if all responsibility were vested in a Federal agency?

Mr. CURRAN. As far as exact numbers are concerned, Mr. Toll, I could not give you that figure myself.

Mr. TOLL. I wondered whether you would comment on this thought: That there are some good State health officers and whether or not it is not desirable to use these people in some of this work of inspecting and checking up on whether or not the health and safety of the workers and the public is being protected?

Mr. CURRAN. This is one of the reasons why we suggest the Public Health Service, because of their close working relationships with the various States and public health departments.

Representative HOLIFIELD. In other words, you do not necessarily recommend that everyone in this field be a Federal employee.

Mr. CURRAN. No, sir.

Representative HOLIFIELD. But you recommend that the responsibility be placed in the Federal Government for supervision and inspection to see that standards are complied with. You would have no objection to contractual obligations with a State, or let us say mutual arrangements with the States for the Federal inspectors to come in to see if the job was being done according to uniform Federal standards?

Mr. CURRAN. That is right.

Representative HOLIFIELD. You would not in effect take away from the States the job of inspecting and enforcing standards, but you would give an overriding responsibility to the Federal Government to see that those standards were enforced effectively. Is that your idea?

Mr. CURRAN. Yes, sir; that is our idea. We feel that the State and the local people have the right to inspect.

Representative HOLIFIELD. You have rightly pointed out that the States have inadequate personnel and inadequate training programs. Would it be your conception that the Federal Government should take the responsibility for a training program? When I say take the responsibility, also take the responsibility of financing such a program and making this available to State personnel, so that they could in turn go to the States and train their own personnel?

Mr. CURRAN. In order to get the job done, I think that is the way it would have to be handled.

Representative HOLIFIELD. Mr. Ramey.

Mr. RAMEY. Your mention of the Public Health Service either as the overall coordinator, and I gather from your discussion with Mr. Holifield, also to handle cooperative relations with the States, the Public Health Service does not have much background or experience in enforcing things, particularly as a legal regulatory enforcement agency, does it?

Mr. CURRAN. We think this is where the AEC should start relinquishing some of its hold and control of those prerogatives. We think under the present act there could be a delegation of some of their authority to the Public Health Service. They can use some of the other Federal agencies, for example.

Mr. RAMEY. There might be a problem in terms of the whole framework and approach of the agency. Public Health, as I understand it, operates mostly through cooperative arrangements with the States. Again this is more or less what you would call your promotional aspects of public health work. Then to change them to the role of an outfit that is establishing overall standards and enforcing these standards by legal means might change their whole outlook and framework, which would be rather difficult to do, it seems to me.

Mr. CURRAN. Is it impossible at present to allow the Public Health Service to assume some of these responsiblities?

Mr. RAMEY. It is possible, but it might have to be a rather gradual thing. That is the point I was raising. As I understand it, on interstate stream pollution, they do have some responsibility under a relatively new law that was passed. They have had just one case, as I understand it, in Colorado, where they have actually taken an enforcement position.

Mr. TAYLOR. That is the Water Pollution Control Act of 1956.

Mr. RAMEY. Yes.

Mr. TAYLOR. Where the Public Health Service can act in furnishing good offices in case of dispute among or between two or more States on a water system which drains into both States, and one State may be responsible for causing pollution in the other State. Public Health doesn't have any direct enforcement authority, but it can act as a sort of judicious umpire in settling the matter.

Senator AIKEN. Do you believe that the Federal Government should exercise control over all occupational diseases?

Mr. TAYLOR. All occupational diseases?

Senator AIKEN. Yes, that the Federal Government should exercise conclusive control over radiation. What about silicosis and other occupational diseases which are likely to be more prevalent and are far more prevalent than diseases of radiation?

Mr. TAYLOR. I think that is a rather tough question to answer, Senator. However, to separate one from the other, the situation with respect to health and safety aspects of atomic energy radiation is something that is invisible and yet it permeates the entire society. There has been insufficient information gathered on it. The possibility of both nationwide and worldwide increase of contamination is endemic in everything that is being done right now both in peaceful and military uses. Therefore, I would say that the Federal role should be much stronger in this field than it would be in silicosis, which is usually limited to a small number of States where mining operations are being conducted, mostly the Western States.

Senator AIKEN. Do you advocate a constitutional amendment to permit the Federal Government to assume this control over the health regulations of a State?

Mr. TAYLOR. I don't recommend that they assume control over the health regulations.

Senator AIKEN. Over this particular hazard or regulation?

Mr. TAYLOR. The position that we take is that the Federal Government should set the standards for permissible dosage levels to human beings. It should undertake to police all the aspects of man-made radiation and to work closely with the State governments in their own programs to see that these standards are carried out on a local level as well as in interstate commerce.

Senator AIKEN. Work closely with the State governments? What do you mean by that?

Mr. TAYLOR. To enable the State governments legislatively to establish their own programs.

Senator AIKEN. What you mean is to tell the State governments, don't you? That is what it amounts to.

Mr. TAYLOR. There is nothing to prevent the State governments, whether the Federal Government tells them to or not, from establishing programs in this field, but only to the extent to which Congress relinquishes the power it already has. The same way as interstate compacts, for example.

Senator AIKEN. Our chairman is a much better constitutional lawyer than I am, but I thought the right to establish regulations affecting health was reserved to the States under the Constitution, and a constitutional amendment would be necessary to change that procedure. Is that right, Mr. Chairman?

Representative HOLIFIELD. Senator Aiken, I appreciate your compliment of being a constitutional lawyer, but as the Senator knows, I am not an attorney.

Senator AIKEN. I am not, either. Therefore we should know a lot of law.

Representative HOLIFIELD. However, I would say in this case we do have a basic established factor which does not obtain in the case of the mines where silicosis is a hazard to the people. We do have the fundamental basic ownership of uranium vested in the Federal Government by the 1946 and the 1954 acts. We also have regulatory power as to the shipment or the granting of licenses to use radioactive products stemming from special nuclear materials. I think the basis exists for the Federal Government imposing rather strict standards and the power to deny licenses in States that would not comply with a standard deemed to be of necessary precautionary effect upon the people of that State, and the adjoining State. It probably does exist in the present act. The factor, of course, of the hazards and danger of radiation being a new danger which transgresses State lines certainly does give the Federal Government concern from an interstate rather than an intrastate point of view.

Senator AIKEN. Yes. Would the States be empowered to enact stricter regulations than the Federal Government does? I am thinking in these terms. I am thinking in terms of milk where most of our cities have standards which are far above those set by the Federal Government. Under the Constitution they can do that. We know our Federal Government grants licenses to moonshiners even in States that prohibit moonshining.

Representative HOLIFIELD. I think the point is well taken. I think there would be no reduction of the State's powers from the standpoint of going beyond the standards set by the Federal Government as long as the Federal Government standards were complied with in this field where Congress has placed Federal responsibility. There is no doubt that Federal responsibility now lies or that responsibility now does lie in the Federal Government.

Senator AIKEN. Federal regulations would then represent a minimum of controls, but the States might be authorized to go beyond that. Is that your position?

Mr. CURRAN. That is our thinking, Senator, yes.

Representative HOLIFIELD. Let us ask the lawyer here.

Senator AIKEN. You have two lawyers here.

Mr. RAMEY. I think we agree on this, Senator Aiken. There is a problem of what lawyers call preemption and on certain aspects of radioisotopes where the Government has ownership and can exercise its control, it depends on whether or not the law is construed as keeping the States out of it. We had quite a discussion of that yesterday. There are two interpretations by various people as to what the AEC bill would do and what their 1957 bill would expressly do, which would permit the kind of arrangement which you are talking about.

Representative HOLIFIELD. Now that we might be properly balanced, I think we should have the other counsel speak because you and I can agree on anything, Senator, but two lawyers can't.

Senator AIKEN. You say there are two interpretations. Now, can we have the other one?

Mr. TOLL. I would say that the chairman is a better constitutional lawyer than I am from practical training even without a law degree. But there is this special consideration, that the Atomic Energy Act does not vest in the Federal Government legal authority to regulate all sources of radiation, but only some. To the extent that the Federal Government attempted to regulate X-ray machines or other uses of radiation, there might be a constitutional problem, as pointed out by Senator Aiken.

Senator AIKEN. I would agree with your interpretation.

Representative HOLIFIELD. I would agree with our counsel on that, too. If your recommendation of centering all manmade radiation in one central Federal agency were followed, it would mean then that agency, whatever it might be, whether Public Health or a separate agency, would of necessity have to be given the same powers in all fields as the Atomic Energy Act now gives the AEC in Government-owned uranium and its derivatives. This I think would pose a constitutional question which the Senator raised.

Mr. CURRAN. You are now chasing us back to our attorneys.

Mr. TOLL. Another constitutional question is in those areas that the Federal Atomic Energy Act does now regulate. Since it does not expressly state that it is excluding the States, or preempting the field, there is a constitutional question as to how far the States can go before they run up against the Federal law. The case that has presented this most directly so far is the State of Minnesota health regulations which have in effect attempted to license reactors. Whether the State can do this at the same time the Federal Government does presents a very fine constitutional question.

Senator AIKEN. I definitely believe that there is a field where the Federal Government should govern. I am thinking of the Yankee atomic plant which some of the members of the committee plan to visit tomorrow. This plant is just barely over the Vermont line in Massachusetts. So Massachusetts will get all of the taxes from the plant, but if anything happens, Vermont will get the radiation. I think the Federal Government will exercise control over that situation.

Representative HOLIFIELD. And this might not be a subject that could be established by State compact any more than the division of the Colorado River waters has been able to be settled by intertsate compact. We have had 25 conferences of multiple States, and have never been able to come to a conclusion on it.

Senator AIKEN. They use all of the Vermont water exclusively for cooling in this Yankee atomic plant, but Massachusetts gets all the taxes.

Representative HOLIFIELD. The only solution I have for you is to build a dam and divert the water back into Vermont.

Senator AIKEN. We could turn it over to the Hudson, perhaps, and cut them off that way.

Representative HOLIFIELD. Mr. Curran, do you or Mr. Taylor have any further testimony.

Mr. CURRAN. I have here, Mr. Chairman, a statement by Leonard English. I thought he would be here by this time, but I am afraid he has been delayed.

Representative HOLIFIELD. I have him next on the list of witnesses, and we will accept his statement for the record.

Mr. CURRAN. Thank you.

STATEMENT OF LEONARD ENGLISH, STAFF REPRESENTATIVE, INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS

Mr. ENGLISH. Mr. Chairman, members of the committee, I would like to take this opportunity to thank you for the privilige of appearing before your committee and allowing me to express the concern of the firefighters in some of the aspects in the development and spread of this new field.

Since we are firefighters and not men trained in the technical and scientific aspects of radiation and its many applications, there is much that we do not know; but, since we are firefighters and charged with public safety, there are some aspects in the development of this field about which we must concern ourselves.

I am sure that we all realize that the biggest job of the firefighter is not the extinguishment of fire, but the prevention of fire. I am certain, too, that we will all realize the areas in which we express concern are areas in which we feel that improvement can be made to increase public safety.

At one of the earlier hearings, I heard it mentioned that we had 16 States which had provisions for an office of coordinator. This, then, would lead us to believe that many of our States do not have a coordinated plan or procedure for transmitting lists of licenses and other pertinent and necessary data to a local community. In checking with the other firefighters throughout the country we find this is true. In some areas, lists of licensees are sent regularly. In many other areas, lists of licensees are never received.

I am sure that we will all agree local communities must have this information if they are to do an intelligent job of community planning and protection, and encouragement should be given to facilitate getting this information from the Federal level through the various agencies and ultimately to the local community.

In lieu of a program of this type, we feel that local registration of all users of radioactive materials is a must.

INSPECTION

It has been mentioned before that frequently the AEC inspectors will bring along on their inspection either a State inspector or a health department inspector. We would urge that the same type cooperation be extended to the local fire inspector or that training be made available for these men.

TRANSPORTATION

This is an area in which the firefighters feel that improvements can be made. We would suggest that this committee check further into this field. Since the use of radioactive materials has become so widespread, it is easily envisioned that more and more of these materials are being shipped by common carriers every day.

Since we do have truck accidents and since we do have truck fires and since most of the identifying markings are either paint or paper labels, we feel that some sort of temporary marking of a fire resistant material should be placed on these trucks when they are carrying radioactive materials and these signs, of course, could be taken off when they are not.

The amount of this material which a truck would have to be carrying before an emblem should be placed on it would, of course, be established by a qualified group. This marking would alert the firefighters and the police officers that a particular hazard was present in the event of an accident.

In the case of large shipments of radioactive materials going through a town, we feel that the local fire department should be notified. In some cities this is done and in many cases a police escort is provided. Some of the fire departments are not notified.

WAREHOUSING

I am sure that we have all seen the huge warehouses and trucking terminals in our large cities. I am certain, too, that we have all observed the large number of trucks which are constantly loading and unloading at these terminals. I feel that it is within reason to assume that many of the packages in these in-transit warehouses or terminals contain radioactive materials which is in transit to various parts of the city or State.

None of the warehouses with which I am familiar has any particular area assigned or marked for the storage of these materials. In the event of a warehouse fire, the markings on the packages could easily be burned off and the material treated like any other.

We feel that areas should be set aside for this storage and that they be well marked with fire resistant signs. We, likewise, feel that limits be established on the quantities of these materials which a warehouse might accept.

IDENTIFICATION

Simplification is the key to any good safety program. The firefighters urge that one identifying label or sign for radioactive material be established for all Federal agencies.

IDENTIFICATION SIGNS

Hazard areas in industry where radioactive materials are either in use or being stored are usually well marked. The markings, however, in most cases are paint or cardboard signs. The firefighters urge a more widespread use of signs of fire-resistant material. We, likewise, urge that a model code be established for municipal use. A study in this direction is now being made by the Municipal League. This could go a long way in simplifying the confusion which I am sure exists in the minds of many who are concerned about this problem at a local level.

As I mentioned earlier, there is no attempt on the part of the firefighters to pretend that we are experts in this field. We are not. We do have a genuine concern and are very anxious and willing to sit down with any group and apply our know-how in public safety to the knowledge of the legislators and scientists and work toward the goal of ultimate safety.

Thank you, Mr. Chairman, members of the committee, for this opportunity.

Representative HOLIFIELD. Our next witness is Mr. Frank Norton, Texas, Southern Governors Conference.

STATEMENT OF FRANK NORTON, DALLAS, TEX., EXECUTIVE VICE CHAIRMAN, REGIONAL ADVISORY COUNCIL ON NUCLEAR ENERGY

Mr. NORTON. Thank you, sir. My name is Frank Norton. I am an attorney in the private general practice of law in Dallas, Tex. I am appearing here as the representative of the Governor of Texas, and particularly in my capacity as executive vice chairman of the Regional Advisory Council on Nuclear Energy, sponsored by the 16 States southern Governors' conference.

The testimony which has been given before this committee this week on behalf of the States points up the great need for sound internal organization by the States to act effectively in the atomic future. It is my purpose here today to briefly outline the method in which the Southern States hope and propose to discharge this responsibility in the most efficient manner.

As early as 1954, at the time of the passage of the Atomic Energy Act, many of the States became increasingly conscious of their responsibility to investigate what developmental and regulatory impact the atomic age might have upon State governments and the public generally. The peculiar circumstances of cold and hot war implications which were and still are the prime motives of the mushrooming Federal interest in the atomic future made it difficult for the States to carve out their immediate and ulimate area of responsibility.

It became quite obvious that some start had to be made and particularly those States which already had atomic plants within their borders and others which were very much interested in the peaceful development of the atom, adopted a series of basic principles of great importance in the sound encouragement of atomic uses. Such principles include among others:

(1) That peaceful atomic development in any field of endeavor cannot be legislated at any level of government but must be encouraged and must grow under our free system of enterprise.

(2) That the State responsibilities in the development and regulation of atomic energy should be carried on by the respective State agencies now in existence.

(3) That some uniformity of standards is highly desirable and even necessary for sound atomic development.

(4) That many different State agencies will ultimately be affected, but that the timing for action differs greatly and that regulation, particularly in technical matters, should be by administrative code of the agency concerned rather than by statute.

(5) That hasty or uncoordinated regulatory action by the State or any of its subdivisions might well be detrimental to the sound development of atomic uses.

(6) That the States do not favor dual licensing or any other type of needless duplication but hope that as the State's ability to handle atomic hazards increases, more of the regulatory functions can be taken over by the States.

(7) That our plans should not be restricted to the present degree of our limited knowledge, but should provide the States with a mechanism permitting sound action in this most technical field in the future.

We are pleased to say that all 48 States have approved these principles and most of the States have taken some action to reach these objectives either by the appointment of a coordinator, the establishment of an advisory committee, the passage of regulations pertaining to the registration of material, or the adoption of a comprehensive radiation code. You will note that such action follows a fairly uniform trend, not by any means exact as to wordage and enforcement, but the pattern is most similar.

In the case of the States administratively grouped under the southern Governors' conference, namely, the States of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia, the early leadership by Governor Collins, of Florida, has resulted in yet another plan which we believe to be completely in line with the stated principles. Following Governor Collins' proposal that the States explore the feasibility of united action in the development of industrial opportunities in the South through nuclear energy, research and otherwise, a series of regionwide conferences resulted in the establishment of a Southern Regional Advisory Council on Nuclear Energy to implement the recommendations which had been adopted.

One of the recommendations adopted by the Governors in 1956 was that:

> The council (Southern Regional Advisory Council on Nuclear Energy) should fully explore the advisability of the establishment of a compact participated in by the States represented in the conference for development of nuclear energy for the advancement of the region, and report its recommendations to the southern Governors' conference.

The favorable conclusion reached in this important study undertaken by the Southwestern Legal Foundation in Dallas are reproduced on pages 346–359 of the Joint Committee Print which furnished excellent background to these hearings. In addition you will find in the committee print on pages 455 through 478, a report by the Council of State Governments which discusses in some detail various methods of intergovernmental relationships in fields other than atomic energy. This will indicate that the Regional Advisory Council had the benefit of arriving at a proposed Southern Interstate Nuclear Compact by both reviewing intergovernmental relationships generally and then by testing the feasibility of a compact in the particular field of inquiry. The council was happy with the results and upon its recommendations the Southern Governors at their annual meeting in September 1958, instructed the council to prepare a compact draft for submission to the States. Last month a final draft was approved by a joint conference of the Southern Regional Advisory Council on Nuclear Energy and the Council of State Governments and adopted in principle by the 16 Southern States. Within a few days the draft will be submitted to Gov. Buford Ellington of Tennessee, the Chairman of the Regional Advisory Council and Chairman of the Committee on Nuclear Energy of the Southern Governors' Conference, for dissemination to the 16 Southern States.

The events which I have recounted leading to the adoption of the draft compact will indicate the care exercised over many months in arriving at the best possible intergovernmental device to achieve the objectives and principles which the States have adopted. During

these months we have had many occasions to touch base with members of this committee and with its staff, and with personnel of the Atomic Energy Commission. We have had much encouragement and also indications of great interest in our efforts, and we would like to extend to all those who have either contributed to the many deliberations or who have shown patience in helping us arrive at this important juncture, our heartiest thanks and appreciation.

Time will not permit the reading of the compact draft, but I do not think this is necessary at this time. I have given a copy to Mr. Toll. In most respects this compact is most similar to the well known and most successful Interstate Oil Compact to which 30 oil-producing States belong. It should be emphasized that the compact is a Southern Interstate Nuclear Compact, designed to assist in the atomic development of the South. As an integral part of sound development, the powers of the board to be created under this compact include recommending changes in, or amendments or additions to the laws, codes, rules, regulations of any of the party States, with due consideration of the desirability of uniformity. The compact also states that the Federal Government may be represented without vote on the board if Federal law so authorizes.

(The draft of the Southern Interstate Nuclear Compact appears at the end of Mr. Norton's testimony, p. 365.)

It is most important that it be understood that this compact, as is the oil compact, is a voluntary and advisory type of compact without any powers of enforcement. It proposes, recommends, acts as a coordinator between the many parties at interest, as a technical adviser and as a sparkplug for action by the party States.

It is anticipated that those States which are immediately concerned with atomic responsibilities will make their experience and solutions available to the other States in the region which enjoy a slower pace of atomic development. "The big pulling the little, or the experienced guiding the fledglings." The technical advice which can be available to all States within a region through a compact organization could never be secured by any individual State.

The southern Governors have repeatedly indicated their determination to proceed with these plans and hope and expect that the example of this sound and thoroughly researched approach in an important future field of endeavor might well be adopted by other States within any geographic or economic region. In any event, the southern example will stimulate activity by other States along the lines of action suggested by the compact organization.

For the above reason we are most interested to see the AEC suggested amendment passed as soon as possible. It is directly in line with what the majority of the States want and need and it is time that congressional leadership clearly indicate that the State acceptance of responsibility which is already an established fact is the direction in which we are proceeding. We know that this bill is an interim device and points the way. But it is necessary and should not be long in its coming.

There might, of course, be some individual States or State officials who, due to the slow pace of atomic uses within their borders or because of a lack of knowledge or to much dependence upon past Federal

atomic activity might not see their way into their atomic responsibilities. The amendment could help to change this attitude.

A few words should be said about the amendment:

1. There should be a clear division of responsibilities between the Federal and the State Governments. Concurrent jurisdiction is not favored.

2. Training and assistance should be provided to the States by the Federal agency, particularly in the early phases of State assumption of jurisdiction.

3. Transfer of jurisdiction should be accomplished after an agreement has been entered into with the State.

4. Such transfer should not be subject to recall. In regard to the controversial paragraph "i," it would seem possible to state that in cases of emergency or new technical developments which indicate present State activities to be inadequate or which have resulted in a complete breakdown of State activities, the State may request assistance from the Federal agency or the Federal agency may provide such emergency assistance.

I would like to close with a statement in regard to this amendment and the possible future transfer of certain functions to the Public Health Service. This amendment should not be held up because of such transfer in the future. Regardless of what agency will act on the Federal level, the States should clearly feel a primary responsibility to watch over the health of their citizens.

May I say that I have found most State agencies with which I have been in contact eager to carry out their responsibilities but most often uncertain on how to proceed, not so much in health protection, but in the many other activities (workmen's compensation, insurance, education, rate making, etc.).

Through this amendment, through the many excellent speeches given by members of the AEC and particularly by members of this committee, there is no doubt that the States will continue to act with increasing effectiveness in this field in the years to come.

I want to say that I appreciate being able to appear before the committee and to indicate the plans that the Southern Governors have in ths direction.

Representative HOLIFIELD. Thank you, Mr. Norton, for this testimony, and for your submission of the appended articles here which I know the members of the staff will study with a great deal of attention.

Senator Aiken, do you have any questions?

Senator AIKEN. No.

Representative HOLIFIELD. Mr. Norton, I want to commend the action which has been taken by the States in having this interstate conference on this subject. I think it will do a great deal toward making the States that are involved realize that this matter cannot be solved completely on a one State level, because of certain factors of radiation hazards which, if an accident occurs such as in a situation as the Senator spoke of in northern Massachusetts, and the radiation might spread to not only Vermont, but to five or six other States, you would immediately have an interstate hazard which an individual State could not possibly cope with.

Mr. NORTON. We have tried to solve that in this compact by adding an article which refers to the right of any two or more of the party

States to enter into supplementary agreements under stated and approved conditions which would mean that possibly the Senator might enter into an agreement, or the State of Vermont and Massachusetts might enter into an agreement to divide the water and divide the revenue.

Senator AIKEN. We have two compacts in New England. We had the first forest fire compact in the country. We also have a compact of the Connecticut River Basin. It has worked very well. I think the compact method is quite desirable.

Mr. NORTON. It does give the stronger States a chance to pull the others up by the bootstraps.

Senator AIKEN. Yes. I was just wondering which one of the Southern States would admit to being a fledgling.

Mr. NORTON. May I refuse to answer that question?

Representative HOLIFIELD. Certainly not Texas. However, they might in size not consider themselves—I would not call them a fledgling, but at least we have Alaska now which claims a greater territorial area.

Senator AIKEN. Texas just emphasizes the fact that they are thawed out. That is their only recourse.

Mr. NORTON. We have stopped talking in Texas about size. We are talking about stature now.

Senator AIKEN. They are resourceful, too.

Mr. TOLL. Mr. Chairman, while we are on this subject, while Senator Aiken is here, it probably should be pointed out that the first interstate movement in the atomic energy field actually came about in New England in about 1954 or 1955. The New England Governors did set up a committee to study State legislation. I am afraid that organization has been more or less inactive in recent years, and the Southern group has been the more active on interstate atomic energy activity in the last 2 or 3 years.

Senator AIKEN. The compact move has been quite strong in the Northeast for a long time, due to the fact that our States are so small and so near together that it is almost necessary to work in agreement. We are competitors, of course, but we still work in agreement on many things. For that reason it has been easier for us to set up compacts than it has in some parts of the country where the States may be six or eight hundred miles apart.

Mr. NORTON. May I say in regard to this compact that we first contemplated a nationwide compact on regulatory problems; but since developmental functions are of very great importance to the Governors concerned, we made sound regulation a necessary adjunct to this development compact. We further decided that it would be best to draw up a development compact strictly for the Southern States which are geographically in that particular area. We are working very closely, however, with the Council of State Governments, and have had joint meetings with the ultimate thought of asking the Congress for enabling legislation of the compact when it does comes into the Congress to permit other States within other regions to enter into similar arrangements under this one compact.

Senator AIKEN. There are some national compacts, of course. If I may boast a little bit, I might say I was the first Governor to sign the interstate parole compact back in 1937 or 1938. I think all States have joined that now. It has been very helpful.

Mr. NORTON. That is right.

Representative HOLIFIELD. Certainly the Chair would say that wherever a compact is feasible between the States it should be worked out. However, having had some experience in trying to obtain compacts with adjoining States on this Colorado River water controversy which has been going on for many years, I recognize that there is a limitation. Where you do have an area of States, and the interests are so divergent you may have some very vital States that would refuse to enter a compact, and in that situation it might not be so bad with ordinary matters which States have to deal with, but with something which might affect the lives of many hundreds of thousands of people, it would certainly be a very dangerous situation if it depends upon compact agreement.

It is in this field, I think, where the Federal Government bases its present responsibility. As you have said, many of the States are not able yet to do this job properly. They should be given all the responsibility that they will discharge.

There are several points in your statement on which I would like some clarification.

On page 2, No. 1, you say that peaceful atomic development in any field of endeavor cannot be legislated at any level of government, but must be encouraged and must grow under our free system of enterprise.

May I ask you what you mean by that?

Mr. NORTON. I mean that we look upon, or I look upon, the development mostly to spring out of men's minds. A doctor will start certain uses of radiation in technology or in treatment of a cancer patient. An agricultural station will start using isotopes for its own particular uses. An industry, like the cigarette industry, will pick up radiation for their particular purposes, and so on. I feel that the development of uses in such a way must be stimulated, to try to get as many people to realize what the atom can do for their particular endeavor and stimulate that right down on the bottom. You cannot just say from here on we shall have atomic development within the State of Texas, let us say. You have to try to get people to start, and you do that by meetings and by various other means to get this across to the public. But I feel that development has to come from the bottom up and only by such means can sound development really be successful. That is the lifeblood of our system versus the system somewhere else, that we try to stimulate the people to give the best they have in them. That is what I had reference to.

Representative HOLIFIELD. I think we probably are thinking along the same lines, but I might point out to you that the some 1,100 industrial uses which have been developed have been developed as a result of legislation which the Federal Government has passed by providing tremendous sums of research and development money, and furnishing materials and so forth. That all stems from legislation. There is no clear demarcation between legislating and appropriating money to get a new industry like this started and the development which, as you say, does occur in the minds of many different people.

Mr. NORTON. I was thinking of the future.

Representative HOLIFIELD. Certainly legislation per se cannot be divorced from the development of a new industry, and that is why you are sitting here before us today.

Mr. NORTON. I would gladly change that statement to take recognition of that fact.

Representative HOLIFIELD. It is not necessary to change it. We know what you mean.

Senator AIKEN. You are talking more about research than actual development, research and imagination.

Mr. NORTON. We find that as soon as you start talking about atomic energy and saying that it is possible to do this or that, people start thinking in their own lines of endeavor and you find action where you least expect it.

Representative HOLIFIELD. How they can apply the basic research that has been done?

Mr. NORTON. Yes.

Representative HOLIFIELD. In item 6, that the States do not favor dual licensing or any other type of needless duplication but hope that the States' ability to regulate atomic hazards increases and more of the licensing functions should be taken over by the States. I think I might be in agreement with that with certain clarification. The power to withhold shipment of radioactive material into States does now exist in the Federal Government, and specifically with the AEC. You would not favor the shipment of this dangerous material or the establishment of potential hazards in a State which refused to adopt proper standards, would you?

Mr. NORTON. No.

Representative HOLIFIELD. That is, of safety to its inhabitants.

Mr. NORTON. No, definitely not.

Representative HOLIFIELD. In other words, in view of the present Federal ownership of this material and the responsibility which is placed upon the AEC for the general welfare of the people, you would not advocate complete State sovereignty in this field, and complete abdication of the AEC in this very vital field of protecting people from potential hazards, would you?

Mr. NORTON. No. I am directing this more or less, for example, in this direction. I am not very much for the Minnesota statute. I think it is unfortunate that this came up at the present time. I was hoping that as the States became more knowledgeable in the field that ultimately more and more licensing responsibilities would go to the State level because of their ability to do the work.

Representative HOLIFIELD. I notice the general makeup of your Southern Regional Advisory Council is strictly advisory.

Mr. NORTON. Yes, sir.

Representative HOLIFIELD. It has no powers of enforcement or anything like that.

Mr. NORTON. That is correct.

Representative HOLIFIELD. It is left up to the different States.

Mr. NORTON. It is very important to note this because in the oil compact this is very similar. The oil compact therefore has to be so good, and their advice so sound that their advice is sought. If it had power of enforcement it would just enforce its regulations; but it has no such powers. Recently the oil companies sat down and prepared a number of standard forms which they would like to use in the oil fields in all the States, namely, 30, where oil is being found. If they had sat down and planned these four on their own, rather than for the compact organization, the antitrust laws might go against them.

This way they were able to recomemnd forms, the forms were approved by the compact organizations of the various States, and now these forms are being adopted by all the States. It is that type of cooperation which, after a great deal of analysis, we feel will be necessary in the atomic future, and will permit sitting together with the AEC, with industry, and with the State officials, to try to arrive on a voluntary basis at the best possible solutions to problems.

Representative HOLIFIELD. I think this is a good approach that you suggest, always keeping in mind that we are dealing with a substance here which has such great potential hazard and something new in the annals of mankind, that we have a substance here which is so powerful, both from the standpoint of its explosive power and even more seriously from the standpoint of its contamination of the atmosphere over a wide area. It seems to me that we cannot rely on the advice of a compact group and voluntary acceptance of that advice and implementation of that advice by different States, because of the hazard that is involved in this peculiar thing which is much different from other commodities that we have, such as oil, coal, and that sort of thing. While you can have an oil fire and an oil explosion or a coal explosion, it is a very small factor in the economy, whereas if you had the wrong kind of atomic reactor incident, such as happened in Windscale, England, for instance, where a great area was contaminated—and this was a very mild incident, as our experts tell us that there can be incidents under certain conditions which would be much greater as a hazard than that, and although unlikely to happen, there is always this possibility—if regulations are not followed closely and precautions taken by which experience we know are necessary in this field for handling this deadly material, a catastrophe could result.

It seems to me that there must be a residual power held in the Federal Government in this particular instance, peculiar as it is, which is not necessary in many other fields of State compact jurisdiction.

Mr. NORTON. We are not by this compact underplaying that at all. The compact is not to change the Federal power or the State power in any way. It is just to facilitate the coordination and to upgrade the response by the States to carry out their respective responsibilities. We presented the compact here somewhat prematurely in a way. We will at a later date explain in more detail how this will work. We came here specifically to indicate to you the Governor's long-range interest in trying to work out a device which will be helpful to the States to discharge their responsibilities.

We do not mean in any way to take from the authority and powers of the Federal Government or the powers of the States. It is only a technical agent which will prepare recommendations in the best possible way and then more or less by the power of its recommendations get the States to adopt things quicker than they would do otherwise.

Representative HOLIFIELD. I notice at the bottom of page 6 you said there should be a clear division of responsibilities between the Federal and State Governments, and concurrent jurisdiction is not favored. I recognize very well the basic constitutional thinking behind this type of recommendation. This I would also couple with your final page and article 4 which assumes that if transfer of jurisdiction should be accomplished after agreement is entered into with a State, such transfer should not be subject to recall. I doubt very much if you can establish in this field such a clear-cut division of responsi-

bility between the Federal and the State Governments that you could turn over to a State complete control without the right of the Federal Government to interfere in the case of a failure of a State to comply with the minimum regulations.

Mr. NORTON. I believe I was stating the hoped for solution. I realize the practical aspects of it. I hate to see the right of recall because it might make the States pensive, and make them feel that they are simply a licensee. I was trying to find some way of face saving for both sides. I realize the problem involved, of course.

Representative HOLIFIELD. It is a real problem. It has got to be looked at. I would hope that it might be solved in such a way that in the setting up of the standards that there would be a requirement in the standards that there be no failure to comply with those standards once they had been accepted by the State, and the State had been delegated or released certain jurisdiction.

I would think it might be well to have the obligation upon the States at least to comply with such regulations and such future regulations as might occur as a result of Federal Government responsibility. I point out as a case in point the constantly shifting standards of the maximum permissible dose which will originate, I believe, in the Federal Government's research, monitoring, and evaluation program. Certainly when the reduction in maximum permissible dose goes down, as it has in the last few years from 100 rem to 5 rem, that shifting of judgment on the part of the Federal Government as a result of its own explorations in this subject and new knowledge being accumulated, this certainly should have some effect upon the States, and if it is for the general welfare of the Nation, the States should be obligated in some way to accept the Federal Government's judgment on this matter.

Mr. NORTON. I fully agree with you. I believe under this compact system a meeting would be called of the respective officials. Let us say there are 16 health directors, 5 of them would be called in, they would pass on the recommendations and say this is sound, let us recommend certain changes, and these changes would go out to the 16 States as the approved recommendation of the compact.

Representative HOLIFIELD. Thank you very much, Mr. Norton, for your appearance here this morning, and your testimony.

Mr. NORTON. Thank you, sir.

(The material submitted by Mr. Norton, follows:)

EXPLANATORY MEMORANDUM TO ACCOMPANY DRAFT OF SOUTHERN INTERSTATE NUCLEAR COMPACT

Approved by a joint conference of the Southern Regional Advisory Council on Nuclear Energy and the Council of State Governments, and approved in principle by the Regional Advisory Council on Nuclear Energy meeting in Nashville, Tenn., on Thursday, April 23, 1959, for submission of the committee on nuclear energy of the southern Governors' conference

INTRODUCTION

An interstate compact is at one and the same time a contract among the participating jurisdictions and a statute in each of them. Consequently, it provides a firm basis for continuing relationships of a cooperative nature among States. Compacts have been used frequently, especially in recent years, as the underlying framework for and authorization of interstate cooperation in many

fields. The southern interstate nuclear compact is designed to establish machinery for cooperation among the party States in this field. The 16 States whose Governors participate in the southern Governors' conference would be eligible participants in the compact.

A preliminary draft of the compact was prepared for consideration at a meeting held in Nashville, Tenn., on April 22–23, 1959, under the joint auspices of the Regional Advisory Council on Nuclear Energy and the Council of State Governments. The draft of a southern interstate nuclear compact appended to this memorandum was approved by that meeting and was also approved in principle by RACNE on April 23, 1959. A brief explanation of the compact's provisions follows.

ARTICLE I

The compact begins with an article devoted to a declaration of policy and purpose. This article is designed to provide a description in general terms of the compact objectives and of the manner in which the compact implements them. It also serves as a statement of legislative intent.

ARTICLE II

Article II of the compact relates to the southern interstate nuclear board created thereby. Its provisions are almost entirely of an administrative nature. The board would have one member from each participating State. Each member would serve in accordance with the laws of the State which he represents. Provision is also made for a Federal member of the board to serve without vote. However, there would be such a member only if Federal law provided for one. Other provisions of the article deal with the detail of board administration.

ARTICLE III

Article III deals with finance. Perhaps the provision requiring most explanation is that concerning the allocation of financial responsibilities among the party States. The compact at ths point provides that the board shall base its budget requests to the individual States on a formula. One half of the cost of operations under the compact will be borne by the party States in equal shares. One quarter will be apportioned on the basis of population and the remaining one-quarter on the basis of relative average per capita income within the party States.

ARTICLE IV

In a field so new and complex as nuclear energy, it is desirable that any agency be able to avail itself of the services of a wide variety of persons and organiaztions with competence in the various aspects of its work. Consequently, article IV gives the board wide latitude in establishing and using advisory committees whose members may be public officials or employees or private citizens.

ARTICLE V

Article V enumerates the powers of the board. These are of a developmental character since the purpose of the compact is to promote, encourage, guide, and assist in the nuclear development of the South. However, development is conceived in its broad sense. It is recognized that promotion of research and some investigation of and attention to problems of mutual assistance in emergency situations is desirable. Consequently, the article also contains powers looking in these directions. Paragraphs (k) and (l) of the article are especially directed toward these objectives.

ARTICLE VI

Article VI provides for supplementary agreements. The board may not wish to use all of its powers or may not have the wherewithal to do so effectively. Some of the party States may wish to go further than others. Subareas of the region may have special problems which they wish to handle within the larger framework of the compact. This article provides a basis on which they can construct such cooperative undertakings. In order to make it possible for the board to assist such subregional groups, the article makes it clear that the board may assist with supplementary agreements. The board would also have a power of approval over supplementary agreements in order to make sure that there was no conflict between subregional activities and undertakings of the entire group of party States via the compact itself.

ARTICLES VII TO IX

The remainder of the compact seems to present only one matter which needs specific comment here. The initial functioning of the compact is predicated on joinder by a minimum of seven States. This was the minimum number of States which the conferees at Nashville believed would be desirable in order to make operations under the compact worthwhile.

SOUTHERN INTERSTATE NUCLEAR COMPACT

ARTICLE I. POLICY AND PURPOSE

The party States recognize that the proper employment of nuclear energy, facilities, materials, and products can assist substantially in the industrialization of the South and the development of a balanced economy for the region. They also recognize that optimum benefit from and acquisition of nuclear resources and facilities requires systematic encouragement, guidance, and assistance from the party States on a cooperative basis. It is the policy of the party States to undertake such cooperation on a continuing basis; it is the purpose of this compact to provide the instruments and framework for such a cooperative effort to improve the economy of the South and contribute to the individual and community well being of the region's people.

ARTICLE II. THE BOARD

(*a*) There is hereby created an agency of the party States to be known as the southern interstate nuclear board (hereinafter called the board). The board shall be composed of one member from each party State designated or appointed in accordance with the law of the State which he represents and serving and subject to removal in accordance with such law. Any member of the board may provide for the discharge of his duties and the performance of his functions thereon (either for the duration of his membership or for any lesser period of time) by a deputy or assistant, if the laws of his State make specific provision therefor. The Federal Government may be represented without vote if provision is made by Federal law for such representation.

(*b*) The board members of the party States shall each be entitled to one vote on the board. No action of the board shall be binding unless taken at a meeting at which a majority of all members representing the party States are present and unless a majority of the total number of votes on the board are cast in favor thereof.

(*c*) The board shall have a seal.

(*d*) The board shall elect annually, from among its members, a chairman, a vice chairman, and a treasurer. The board shall appoint an executive director who shall serve at its pleasure and who shall also act as secretary, and who, together with the treasurer, shall be bonded in such amounts as the board may require.

(*e*) The executive director, with the approval of the board, shall appoint and remove or discharge such personnel as may be necessary for the performance of the board's functions irrespective of the civil service, personnel or other merit system laws of any of the party States.

(*f*) The board may establish and maintain, independently or in conjunction with any one or more of the party State, a suitable retirement system for its full-time employees. Employees of the board shall be eligible for social security coverage in respect of old age and survivors insurance provided that the board takes such steps as may be necessary pursuant to Federal law to participate in such program of insurance as a governmental agency or unit. The board may establish and maintain or participate in such additional programs of employee benefits as may be appropriate.

(*g*) The board may borrow, accept, or contract for the services of personnel from any State or the United States or any subdivision or agency thereof, from any interstate agency, or from any institution, person, firm or corporation.

(*h*) The board may accept for any of its purposes and functions under this compact any and all donations, grants of money, equipment, supplies, materials, and services (conditional or otherwise) from any State or the United States or any subdivision or agency thereof, or interstate agency, or from any institution person, firm, or corporation, and may receive, utilize and dispose of the same.

(*i*) The board may establish and maintain such facilities as may be necessary for the transacting of its business. The board may acquire, hold, and convey real and personal property and any interest therein.

(*j*) The board shall adopt bylaws, rules, and regulations for the conduct of its business, and shall have the power to amend and rescind these bylaws, rules, and regulations. The board shall publish its bylaws, rules, and regulations in convenient form and shall file a copy thereof, and shall aso file a copy of any amendment thereto, with the appropriate agency or officer in each of the party States.

(*k*) The board annually shall make to the Governor of each party State, a report covering the activities of the board for the preceding year, and embodying such recommendations as may have been adopted by the board, which report shall be transmitted to the legislature of said State. The board may issue such additional reports as it may deem desirable.

ARTICLE III. FINANCES

(*a*) The board shall submit to the executive head or designated officer or officers of each party State a budget of its estimated expenditures for such period as may be required by the laws of that jurisdiction for presentation to the legislature thereof.

(*b*) Each of the board's budgets estimated expenditures shall contain specific recommendations of the amount or amounts to be appropriated by each of the party States. One half of the total amount of each budget of estimated expenditures shall be aportioned among the party States in equal shares; one quarter of each such budget shall be apportioned among the party States in accordance with the ratio of their populatoins to the total population of the entire group of party States based on the last decvennial Federal census; and one quarter of each such budget shall be apportioned among the party States on the basis of the relative average per capita income of the inhabitants in each of the party States based on the latest computations published by the Federal census-taking agency. Subject to appropriation by their respective legislatures, the board shall be provided with such funds by each of the party States as are necessary to provide the means of establishing and maintaining facilities, a staff of personnel, and such activities as may be necessary to fulfill the powers and duties imposed upon and entrusted to the board.

(*c*) The board may meet any of its obligations in whole or in part with funds available to it under article II(h) of this compact, provided that the board takes specific action setting aside such funds prior to the incurring of any obligation to be met in whole or in part in this manner. Except where the board makes use of funds available to it under article II(h) hereof, the board shall not incur any obligation prior to the allotment of funds by the party jurisdictions adequate to meet the same.

(*d*) Any expenses and any other costs for each member of the board in attending board meetings shall be met by the board.

(*e*) The board shall keep accurate accounts of all receipts and disbursements. The receipts and disbursements of the board shall be subject to the audit and accounting procedures established under its bylaws. However, all receipts and disbursements of funds handled by the board shall be audited yearly by a qualified public accountant and the report of the audit shall be included in and become part of the annual report of the board.

(*f*) The accounts of the board shall be open at any reasonable time for inspection.

ARTICLE IV. ADVISORY COMMITTEES

The board may establish such advisory and technical committees as it may deem necessary, membership on which to include but not be limited to private citizens, expert and lay personnel, representatives of industry, labor, commerce, agriculture, civic associations, medicine, education, voluntary health agencies, and officials of local, State and Federal Government, and may cooperate with and use the services of any such committees and the organizations which they represent in furthering any of its activities under this compact.

ARTICLE V. POWERS

The board shall have power to:

(*a*) Ascertain and analyze on a continuing basis the position of the South with respect to nuclear and related industries.

(*b*) Encourage and promote the development and use of nuclear energy, facilities, installations, and products as part of a balanced economy.

(*c*) Collect, correlate, and disseminate information relating to civilian uses of nuclear energy, materials and products.

(*d*) Conduct, or cooperate in conducting, programs of training for state and local personnel engaged in any aspect of

(1) Nuclear industry, medicine, or education or the promotion or regulation thereof.

(2) The formulation or administration of measures designed to promote safety in any matter related to the development, use or disposal of nuclear energy, materials, products, installations, or wastes.

(*e*) Organize and conduct, or assist and cooperate in organizing and conducting, demonstrations of nuclear product, material, or equipment use and disposal and of proper techniques or processes for the application of nuclear resources to the civilian economy or general welfare.

(*f*) Undertake such nonregulatory functions with respect to nonnuclear sources of radiation as may promote the economic development and general welfare of the region.

(*g*) Study industrial, health, safety, and other standards, laws, codes, rules, regulations, and administrative practices in or related to nuclear fields.

(*h*) Recommend such changes in, or amendments or additions to the laws, codes, rules, regulations, administrative procedures and practices or ordinances of the party States in any of the fields of its interest and competence as in its judgment may be appropriate. Any such recommendation shall be made through the appropriate State agency with due consideration of the desirability of uniformity but shall also give appropriate weight to any special circumstances which may justify variations to meet local conditions.

(*i*) Prepare, publish, and distribute (with or without charge) such reports, bulletins, newsletters, or other material as it deems appropriate.

(*j*) Cooperate with the Atomic Energy Commission or any agency successor thereto, any other officer or agency of the United States, and any other governmental unit or agency or officer thereof, and with any private persons or agencies in any of the fields of its interests.

(*k*) Act as licensee of the U.S. Government or any party State with respect to the conduct of any research activity requiring such license and operate such research facility or undertake any program pursuant thereto.

(*l*) Ascertain from time to time such methods, practices, circumstances, and conditions as may bring about the prevention and control of nuclear incidents in the area comprising the party States, to coordinate the nuclear incident prevention and control plans and the work relating thereto of the appropriate agencies of the party States and to facilitate the rendering of aid by the party States to each other in coping with nuclear incidents. The Board may formulate and, in accordance with need from time to time, revise a regional plan or regional plans for coping with nuclear incidents within the territory of the party States as a whole or within any subregion or subregions of the geographic area covered by this compact.

ARTICLE VI. SUPPLEMENTARY AGREEMENTS

(*a*) To the extent that the board has not undertaken an activity or project which would be within its power under the provisions of article V of this compact, any two or more of the party States (acting by their duly constituted administrative officials) may enter into supplementary agreements for the undertaking and continuance of such an activity or project. Any such agreement shall specify its purpose or purposes; its duration and the procedure for termination thereof or withdrawal therefrom; the method of financing and allocating the costs of the activity or project; and such other matters as may be necessary or appropriate. No such supplementary agreement entered into pursuant to this article shall become effective prior to its submission to and approval by the board. The board shall give such approval unless it finds that the supplementary agreement or the activity or project contemplated thereby is inconsistent with the provisions of this compact or a program or activity conducted by or participated in by the board.

(*b*) Unless all of the party States participate in a supplementary agreement, any cost or costs thereof shall be borne separately by the States party thereto. However, the board may administer or otherwise assist in the operation of any supplementary agreement.

(c) No party to a supplementary agreement entered into pursuant to this article shall be relieved thereby of any obligation or duty assumed by said party State under or pursuant to this compact, except that timely and proper performance of such obligation or duty by means of the supplementary agreement may be offered as performance pursuant to the compact.

ARTICLE VII. OTHER LAWS AND RELATIONSHIPS

Nothing in this compact shall be construed to:

(a) Permit or require any person or other entity to avoid or refuse compliance with any law, rule, regulation, order, or ordinance of a party State or subdivision thereof now or hereafter made, enacted or in force.

(b) Limit, diminish, or otherwise impair jurisdiction exercised by the Atomic Energy Commission, any agency successor thereto, or any other Federal department, agency, or officer pursuant to and in conformity with any valid and operative act of Congress.

(c) Alter the relations between and respective internal responsibilities of the government of a party State and its subdivisions.

ARTICLE VIII. ELIGIBLE PARTIES, ENTRY INTO FORCE AND WITHDRAWAL

(a) Any or all of the States of Alabama, Arkansas, Delaware, Florida, Georgia Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia shall be eligible to become party to this compact.

(b) As to any eligible party state, this compact shall become effective when its legislature shall have enacted the same into law: *Provided*, That it shall not become initially effective until enacted into law by seven States.

(c) Any party State may withdraw from this compact by enacting a statute repealing the same, but no such withdrawal shall become effective until the Governor of the withdrawing State shall have sent formal notice in writing to the Governor of each other party State informing said Governors of the action of the legislature in repealing the compact and declaring an intention to withdraw.

ARTICLE IX. SEVERABILITY AND CONSTRUCTION

The provisions of this compact and of any supplementary agreement entered into hereunder shall be severable and if any phrase, clause, sentence, or provision of this compact or such supplementary agreement is declared to be contrary to the constitution of any participating State or of the United States or the applicability thereof to any government, agency, person, or circumstance is held invalid, the validity of the remainder of this compact or such supplementary agreement and the applicability thereof to any government, agency, person, or circumstance shall not be affected thereby. If this compact or any supplementary agreement entered into hereunder shall be held contrary to the constitution of any State participating therein, the compact of such supplementary agreement shall remain in full force and effect as to the remaining States and in full force and effect as to the State affected as to all severable matters. The provisions of this compact and of any supplementary agreement entered into pursuant hereto shall be liberally construed to effectuate the purposes thereof.

Representative HOLIFIELD. Our next witness is Mr. William A. McAdams, U.S. Chamber of Commerce.

STATEMENT OF WILLIAM A. McADAMS, CHAMBER OF COMMERCE OF THE UNITED STATES

Representative HOLIFIELD. We appreciate your appearance here this morning.

Mr. MCADAMS. Thank you, Mr. Chairman.

My name is William A. McAdams. I am manager of Industry Standards, Engineering Services Division of the General Electric Co.

I am here to present the views of the Chamber of Commerce of the United States. As you may know the chamber is a federation of some

3,450 business organizations which have a membership of some 2,750,000 businessmen.

The chamber's position on this important subject is based upon policies which have been approved by its members and on a comprehensive study by its Committee on Commercial Uses of Atomic Energy in cooperation with other interested committees.

I have with me this morning Mr. Leonard Lederman, who is the secretary of this Committee on Commercial Uses of Atomic Energy.

The national chamber appreciates the opportunity to participate in these hearings on Federal-State relationships in the atomic-energy field. We are particularly interested in this subject, first, because of our ardent belief that a strong and healthy Federal system of government is basic to the preservation of the gains this Nation has made in growth, prosperity, and personal freedom; and, second, because we believe that the sound and progressive development of the atomic industry is important to the economic growth of the United States and to the welfare and security of the American people.

The atomic-energy industry is relatively young, and its activities must now be geared into a governmental structure which has been in existence since 1789. The healthy growth of the industry depends to a considerable extent on the nature and practicability of the regulatory controls of various governmental levels.

It is, therefore, important that the responsibilities of the Federal, State, and local governments, and their relationships with each other, be clearly and completely defined. These hearings on Federal-State relationships are timely and should do much to promote a better understanding of the problems involved.

The need to examine Federal-State relationships in the atomic-energy industry can be attributed to the unusual way in which the industry has developed. Ordinarily, a new industry starts locally and is subject to local government regulation. The State and Federal Governments become involved only as the industry expands, or as it begins to market products and services over wider areas.

Regulation or licensing usually comes about when private and public groups recognize a need for control. The development of the standards on which such regulation or licensing is based is typically a cooperative effort, with industry, labor, and Government participating. In many instances the firms in an industry have put recognized standards into early use on a voluntary basis.

On the other hand, the atomic-energy industry had its beginning as a military project and, for reasons of national security, was a tight Federal enterprise operated by the Atomic Energy Commission. Safety and other standards in the industry were developed largely by the industrial contractors to the AEC and were made a part of the operating procedures of the AEC. At this stage there was little need for regulatory control.

This situation changed when Congress passed the Atomic Energy Act of 1954. This act made it possible for private industry to obtain nuclear fuels and byproduct materials under license from the AEC, but for use outside AEC facilities. This appeared to leave certain areas of regulation either undefined or in the hands of the States. The States have been quick to recognize this situation and have taken action to assume responsibilities which they believe are now theirs.

Areas where regulatory control may be required: There are a number of fields involving many Government agencies where some regulation of the atomic-energy industry may be appropriate. These include:

1. Distribution of source, byproduct, and special nuclear materials.
2. Radiation safety of workers.
3. Disposal of wastes and the pollution of air and water.
4. Transportation of radioactive materials.
5. Use of radioactive materials in drugs and manufactured products.
6. Zoning requirements for reactors and radiation facilities.
7. Building construction and inspection practices.
8. Licensing or certification of professional personnel.
9. Procedures of emergency agencies such as the fire and police departments.
10. Financing and operation of nuclear powerplants.

It is clear that some of these fields of interest are the specific responsibility of certain agencies of government at some particular level. Other problems, however, are, and should be, of concern to agencies at all levels of government.

Let us consider the problem of waste disposal as an example. If a laboratory or industrial plant is engaged in work with radioactive materials, it may generate some radioactive wastes. The local community has a right to be concerned about the possible release of harmful amounts of such wastes to its water supply or sewage system. Certainly it is justified in passing local ordinances to protect its citizens from the hazards of such materials.

If the wastes to be discharged will go to the ground or surface waters, a considerable area beyond the local community may be affected, and county, State, or even regional agencies may find it necessary to take some regulatory action to control the disposal. In such cases, county and State health departments; water control boards; fish, game and conservation agencies; and regional commissions for the administration of interstate compacts may all come into the picture.

If the wastes are to be disposed of in the ocean, the Federal Government will have to exert the control and this may eventually have to be worked out in international agreements.

Representative HOLIFIELD. You would not advocate this particular statement here in this paragraph, that the subject of disposal of radioactive wastes be left in a hiatus between the adoption of proper compacts by groups of States and the Federal Government?

Mr. MCADAMS. No, sir.

Representative HOLIFIELD. You undoubtedly want the Federal Government to maintain that strict supervision until that occurred?

Mr. MCADAMS. As I go on to say here in the next part of the statement——

Representative HOLIFIELD. You drew the line there between the local States disposal in the local States and in the ocean as though the Federal Government would have the responsibility in one instance and in the other instance the States would have it?

Mr. MCADAMS. I am saying here that I think in this particular area of waste disposal it is possible that some responsibilities will have to be left with the local community. For example, in the reservoirs which supply the local water, the local community may have to set up limits.

At the same time the Federal Government may have to set up limits for wide areas of waters, for the oceans, and for some of the other situations.

Then there will be agencies in between, and each will have some specific responsibility.

Representative HOLIFIELD. Certainly I think if there is any local hazard, which is narrow in its scope from the release of low level waste materials, that is a proper concern of the local area. But I do not think it is necessarily an exclusive concern because in those areas which are negligent in providing their people this safety I still believe the Federal Government could not discharge its responsibilities unless it took hold of this and took precautionary measures even to the extent of withholding radioactive source materials from that particular operation unless it complies with minimum standards.

Mr. MCADAMS. I spell out our recommendations on this point in detail a little later.

Representative HOLIFIELD. That is fine.

Mr. MCADAMS. Waste disposal may appear to be an example where Federal regulation would be a solution to the problem. This is not the case, however, for there are too many factors affecting this particular problem to make a Federal regulation practicable for all or even most waste disposal situations. The geological and hydrological conditions in the area, the amount of dilution of the wastes, the extent of channeling in the streams, the location of the points of consumption and other such matters will differ from one locality to another and a set of rules adequate to deal with all situations is certain to be unnecessarily restrictive to many.

We believe it is possible to delineate the separate responsibilities of these many agencies in a way which will permit each to analyze the problem with respect to its own responsibilities, and to set its own regulations for controlling radioactive wastes just as it does for other contaminants.

The other fields of interest—transportation, zoning, protection of workers, qualification of professionals, and so on—involve different kinds of problems. In most cases there are existing agencies at one or more levels of government which can deal with the problems satisfactorily. It is our belief that wherever possible the regulatory problems of the atomic energy industry should continue to be handled by existing rather than special agencies.

Status of regulatory control in the atomic industry: During the last 3 days, this committee has heard much testimony about the regulatory actions which various agencies of government have taken to control the atomic energy industry. I would like to review this picture very briefly.

At the Federal level—in addition to the many regulations of the AEC—the Food and Drug Administration, the Department of Labor, the Department of Commerce, the Public Health Service, the Interstate Commerce Commission, the Coast Guard, the Post Office Department and many other agencies have each promulgated some rules dealing with the atomic energy field. Most of these have been in the area of radiation protection.

At the State level, 8 States have issued comprehensive radiation protection codes; and 19 have established requirements for the registration of radiation sources, 13 have passed enabling acts making the

health department, or, in a few cases, the labor department, responsible for health and safety in the use of radiation sources and nearly all States have adopted some radiation protection rules.

In addition, many States have approved, or at least considered, legislative proposals on zoning, the use of radioactive materials in drugs and manufactured products, transportation, qualifications of professional people, and a number of other atomic energy matters. The public service commissions of at least a dozen States have issued rulings on the financing of power reactors, and at least three have issued reactor construction permits.

The States are continuing to study the impact of atomic energy on the activities within their boundaries and are organizing to deal with problems as they develop. Fifteen States have passed laws to coordinate atomic developments, and most of these 15 have set up an executive officer to look after these programs. About two-thirds of the States have appointed atomic energy study groups or commissions, and many of these are examining the laws and codes of their States to see if they are adequate to deal with a growing atomic energy industry.

(We have appended to this statement a list of examples of typical legislative proposals which have been considered by the States during the last 2 years. This list is indicative of the many fields of interest which are involved in atomic energy problems.) (See p. 385.)

I might say altogether more than 125 proposals have been considered by the States just during 1958 and so far this year.

Now what effect has all of this regulatory activity had on the atomic energy industry? One cannot be absolutely certain of the answer to this question, but the national chamber's contacts indicate that there have not been too many problems with the regulations to date. This may seem surprising, since so many agencies of government have been involved, but there are good reasons why it is so.

Representative HOLIFIELD. When you say with the regulations to date, you mean with Federal and State regulations?

Mr. MCADAMS. I mean all of them together.

In the first place the major portion of the regulatory action has been in the field of radiation protection. Almost without exception, agencies developing rules in this field have turned to the broadly based National Committee on Radiation Protection and Measurement for advice. The result has been a reasonably uniform set of regulatory controls with only minor variations in details or interpretations.

Another reason why industry has had little trouble with atomic energy regulations is the care which the legislators and officials of government have given to the proposals in the early stages. They have consulted with industry, labor, and professional groups and have been receptive to suggestions for improving the proposals.

They have also shown a willingness to change provisions of codes which have turned out to be too restrictive or not protective enough. The legislators and officials of government have tried to promote uniformity in the rules adopted by giving consideration to model laws, codes, and regulations suggested by such groups as the Council of State Governments and the American Public Health Association.

Of course, it must be recognized that we have been going through a trial period for the last several years. During this time, the AEC has continued to exert a considerable control over many phases of the

industry and other agencies of government have been generally willing to let AEC have free reign. As the personnel in these other agencies become more competent in the field, and as industry grows larger and spreads to broader areas, the whole picture can be expected to change. It is important that we consider now what revisions of the regulatory structure need to be made to promote the best climate for a safe, healthy, and vigorous atomic energy industry.

In the background material prepared for this hearing, the committee outlined nine policy questions which seem to cover the principal issues of Federal-State relations in the field of atomic energy.

Our recommendations on these issues are summarized in our answers to these questions, which follow:

Question 1. Division of responsibilities

Should an amendment delineating Federal-State responsibilities in the atomic energy field provide for—

(*a*) exclusive responsibility by the Federal Government?

(*b*) exclusive responsibility by State governments?

(*c*) concurrent responsibility by both Federal and State Governments so that some or all radiation sources and activities would be regulated by both?

(*d*) separated responsibilities between the Federal and State Governments so that some types of sources and activities would be subject to exclusive Federal regulation, and other types of sources and activities would be subject to exclusive State regulation?

There should be an amendment to the Atomic Energy Act to provide for separated responsibilities between the Federal and State Governments so that some matters will be under exclusive Federal regulation, while others will be under exclusive State regulation. However, it should be recognized that there will be some cases where both the Federal and State Governments will have specific responsibilities in the same field of interest—waste disposal, for example. In such cases these separate responsibilities must be clearly delineated.

With respect to current practices, we recommend that all regulatory activity now vested in the AEC be ceded to the States, except for the following:

(*a*) the reactor safety considerations in the construction and operation of production or utilization facilities;

(*b*) quantities of nuclear material in excess of Atomic Energy Commission standards of criticality;

(*c*) the transportation of source, byproduct, and special nuclear material in interstate commerce;

(*d*) the disposal of source, byproduct, or special nuclear material into any offshore waters or any other disposal in such quantities or of such levels of radioactivity as the Atomic Energy Commission deems may create a general environmental hazard.

I believe this answers your question before.

Representative HOLIFIELD. Yes. I think this is very important where State levels might well be trusted to dispose of some of the low-level waste itself, but when you get into high-level wastes such as we have to store at Hanford and other places in stainless steel tanks, a complete control over the continued responsibility which will exist as a result of the long life of these radioactive materials would indicate that this would be a Federal responsibility solely.

It might be the State's responsibility to deliver to the Federal Government or to a Federal repository such levels of waste above a certain level, and then it would be the responsibility of the Federal Government to take over and continue supervision of those wastes until they were safely disposed of, if it is possible, or safely stored for the centuries it might be necessary to store them.

Mr. McAdams. This is our position. We feel that this matter should be left with the Federal Government.

(*e*) The construction and operation of federally owned facilities.

We recommend continuation of Federal jurisdiciton over item (a), reactor safety, for the present, only because we recognize that this matter requires a kind of technical competence which few States are now able to provide. We firmly believe that this activity should be taken over by the States as soon as they have accumulated experience in this field.

In this connection we also recommend that the States be encouraged to participate in matters involving reactor safety. In particular:

(1) The AEC should invite any interested State or State agency to designate a State official to participate in any hearing held pursuant to section 189 of the Atomic Energy Act on permits for construction and operation of reactor facilities;

(2) The AEC should invite the States to participate informally in the site selection of reactor facilities;

(3) The States should be granted authority to require registration and inspection of reactor facilities.

Representative Holifield. Those in general seem to be wise recommendations. Certainly I believe that the States should have something to say about the location of a potential hazard of this type. I am not prepared to say that they should be in a position to overrule, although I am not prepared to say that they shouldn't have that opportunity either.

This location of reactors has been a subject that I have worried about a great deal. I opposed, and I think I may have been the only one that opposed, the $500 million compensation factor, not because I didn't want to see a financial responsibility setup but I was more concerned with the location of reactors.

I thought that we should have gone into the field of setting up standards for the location of reactors, and I personally thought they should be much farther away from great populated centers than some of them have been located, strictly from the standpoint of the fact that we are going into a new field.

I felt that one large reactor incident would cause such great loss of life that it might preclude any further development in the industrial field if it should occur. I felt that a great deal more attention should be paid to the location of reactor sites than to trying to compensate for a lack of attention, you might say, by promising to pay people or the remaining relatives of those who have been killed $500 million. I thought the human factor was much more important than the other factor.

Mr. Toll. Mr. McAdams, have you had a chance to look at the AEC proposed bill?

Mr. McAdams. Yes, sir; I have studied it thoroughly.

Mr. TOLL. Do you have a copy with you?

Mr. MCADAMS. Yes.

Mr. TOLL. I would like to compare your recommendations as to the areas that you believe should be retained under Federal responsibility with those in the AEC proposed bill as set forth in subsection b(2) on page 3 of the bill.

Mr. MCADAMS. I have it in front of me, sir.

Mr. TOLL. In my personal opinion I think perhaps your listing is superior to that of the AEC in the bill. It is similar, but it lists in addition to reactors—the AEC lists includes reactors, export and import——

Mr. MCADAMS. I think we would agree that this—export and import—is clearly a Federal responsibility.

Mr. TOLL. You also list "transportation of materials in interstate commerce" which the AEC bill does not include. Your disposal into ocean is similar to the AEC bill.

You also would list the operation of federally owned facilities on which the AEC bill is silent. You recommend that all regulatory activity now vested in the AEC be ceded to the States except for the following and then list five exceptions, and one of those is the operation of federally owned facilities.

The AEC bill is silent on this question as to whether or not the States would have authority to regulate federally owned and operated facilities.

Representative HOLIFIELD. And probably to grant the construction license.

Mr. MCADAMS. That would be right.

Mr. TOLL. Do you believe, Mr. McAdams, that these items you listed, (a), (b), (c), (d), and (e) should be exclusively Federal?

Mr. MCADAMS. At least for the time being. I explained the case on reactor safety. I think this might carry over to some of the other matters at some later date. But I think for the present the Federal Government is best qualified to handle these responsibilities and we should plan to let them carry on in these areas at least for the time being.

Representative HOLIFIELD. Why do you include the construction and operation of federally owned facilities? If the State is given the power of veto over site selection, you would retain that with the States. You are speaking of the actual construction but not necessarily the selection of the site?

Mr. MCADAMS. That is right. In the other matter, I feel that right now the AEC does a pretty good job of consulting with State officials about where they are going to locate a reactor. I think they need to continue and extend this. Whether or not the State or the Federal Government would have a veto power I am not prepared to say. I think this is a legal matter and I am not a lawyer.

Representative HOLIFIELD. On this factor of safety, I would lean in the belief that if the best judgment of a State was that a reactor should not be built in an area, I am not prepared to say definitely, I would almost say complete veto power by the State over the location of one of these reactors.

I think it should have to be on the basis of establishing an arbitrary exercise of authority. If a sovereign State in its own best judgment objected to the location of one of these reactors, I am not so sure

but what they should not be given a veto power over a federally selected site.

Mr. McAdams. I dont' understand the legal implications of that problem, and I decided I would not register an opinion on it.

I believe we are at question two, then, dealing with assistance to States.

Question 2. Assistance to States.

In order to increase capacities of States to assume more responsibility in this field, should AEC and other Federal agencies be directed to provide increased training and other assistance to State and local authorities, or are existing methods of cooperation adequate?

Federal agencies, particularly the AEC and the Public Health Service, should continue to provide training and other nonfinancial assistance to the States at about the same pace as the last 2 or 3 years. Such assistance will help the States to become competent and will promote consistency in the regulations developed by the States.

Representative Holifield. You are not suggesting there that there should be an enlarged training program? Our experience has been that many States have not been able to train personnel. It is such a new industry for one reason and in some cases the States have not recognized a need for it.

Mr. McAdams. There are two factors here. I said the same pace because there are a limited number of teachers at the present time and a limited number of students. I think if you increase the number of programs you may actually dilute the teaching and the students as well. I am not sure this would accomplish a great deal more.

Also many colleges and universities are now gearing up to provide training both at the graduate and undergraduate level. I think we should let this go along to see how it develops before we can come out and advocate a strong increase in our present Federal training programs.

Representative Holifield. Certainly, assistance to universities by the preparation of proper material and certain key training or training of key personnel at universities and States would be a way to multiply this training program without undue Federal expenditures.

I think it could be fitted into the regular teaching program of many of the States in the place of teaching them completely theoretical or academic aspects. It might be that the practical aspects of this new industry might well be taught along with the theoretical and academic.

Mr. McAdams. We agree, and we believe that there are many State public health officials who, with a little additional training, can become qualified to deal with radiation protection matters along with their regular duties. The major training effort should be directed at these people.

Question 3. Scope

As to the radiation sources and activities to be covered by such an amendment to the Atomic Energy Act, should it—

(*a*) apply to all materials (source, byproduct, and special nuclear) and facilities (e.g., reactors) now covered by the act and now subject to regulation by AEC?

(*b*) apply to (*a*) and also (by extension of the act) to materials and radiation sources (e.g. radium, X-rays, accelerators, etc.) not now covered by the act nor regulated by AEC?

(*c*) apply to some materials and facilities now covered by the act, but not others?

The amendment to the Atomic Energy Act should apply only to those materials and activities now covered by the act and now subject to regulation by the AEC. Sources and activities not now covered by the act are clearly within the authority of the States and are already subject to many regulations of the States. It is therefore unnecessary to bring these items under the act, and to do so would only confuse the issue and create legal and other problems which would take years to solve.

Representative HOLIFIELD. Could you give us any examples of what you are talking about in this paragraph? Sources and activities not now covered by the act.

Mr. MCADAMS. I am thinking here of the X-ray installations and the radium, polonium, and other natural radioactive materials which we are using at various places. These things are not now covered by the Atomic Energy Act, and I think it would be most difficult legally to bring them under the act at this time, after many State laws and codes have already been developed.

I think if we did this, we would simply create problems which might really throw our program into reverse, and delay us from achieving what we really want in protection.

Mr. TOLL. You would not oppose any efforts by the Public Health Service to try to increase the capabilities of the States to better protect the public from these other sources?

Mr. MCADAMS. I believe the Public Health Service has the authority and responsibility now to help the States in all matters of health and safety. I think any way it can help the States will be beneficial.

Representative HOLIFIELD. I think as the subject of radiation becomes better known recommendations in this field are certainly in order. I think we are finding out that people have been unduly damaged by a lack of knowledge on the part of the people using these instruments, even among the doctors.

I think there is clear evidence to show that using X-rays on the fetus of pregnant women there is a clear damage that has existed which has been apparently unknown by the doctors and consequently by the State people and by the Public Health people.

As these new facts are developed, you would suggest according to your philosophy that through the Public Health Service the States be informed and then you would leave it up to the States as to what they did about it?

Mr. MCADAMS. That is right.

I believe we are now on question 4.

Question 4. Method and time of transfer

If some or all regulatory responsibilities are to be transferred by the Federal Government to the States, should such transfer become effective—

(*a*) as soon as the amendment becomes effective?

(*b*) after certification by the Governor of the State that the State is qualified?

(*c*) after agreement between AEC and a State on a regulatory plan?

(*d*) after approval by the Congress of a regulatory plan adopted by the State and recommended by AEC?

(*e*) after approval by the Congress of an interstate compact between two or more States?

Regulatory responsibilities transferred to the States should become effective in a State after the AEC and the State have concurred on a regulatory plan which is adequate to protect the health and safety of the public and which is not unduly burdensome to industrial progress. To facilitate the formation of a suitable regulatory plan, the AEC should establish written standards by which it will evaluate a particular plan.

In any case, a plan should not be rejected until a public hearing is held before the Commissioners and the reasons for rejection spelled out in detail.

Representative HOLIFIELD. In a case like that how would you take care of new developments and new information which would come to the Federal Government before the States have access to it? How would you solve the problem of failure to comply with the responsibilities which had been transferred to them?

Mr. MCADAMS. I think you have to rely on the States. Once they have established a suitable regulatory plan which the AEC has approved and has had a chance to examine carefully, the States will continue to assume their responsibilities in the area. I don't know that we can do anything at this point at the Federal level to make sure that they do.

Representative HOLIFIELD. We had to do something on the stream pollution on the Federal level because the States wouldn't recognize their interstate responsibilities. The upstream State would pollute the stream and the downstream State was powerless to solve the problem.

Mr. MCADAMS. I think you you could still do this sort of thing if, at some later date it looked as though a State were not accepting its responsibility well. The Federal Government could always come back in and look at the situation again.

Representative HOLIFIELD. And enact Federal legislation at that time?

Mr. MCADAMS. If it is necessary. I would like to think that once the States accept this responsibility that they can rely on the recommendations of the National Committee on Radiation Protection and bring their regulations up to date with the latest information and maintain a very effective program.

Representative HOLIFIELD. Of course, we found out in the mining field—coal mining field, for instance—that the pressure of economics in certain States was so great that those States would not comply with recognized safety measures to protect the miners and the time did come when the Federal Government did have to step into the matter in certain areas and pass some Federal safety measures for mines.

Mr. MCADAMS. I think this would still be possible in this area. This goes on into the next question.

Question 5. Transfer subject to recall

If some or all regulatory responsibilities are to be transferred by the Federal Government to the States, should such transfer be made

subject to a right of recall or reassertion of Federal authority under certain stated conditions? Would any constitutional question be raised by such a provision?

Transfer of regulatory responsibilities should not be subject to recall or reassertion of Federal authority. Such a provision would seriously qualify the recognition of State authority and its responsibility to protect the health and safety of its citizens. The net effect would be that the Federal Government would retain ultimate authority merely "licensing" the States to carry out that authority.

I feel also here that if you left the situation so that reassertion was possible you would have a situation where it was still unclear as to whether the Federal Government or the State government was really responsible if an incident did occur. It would be uncertain who would be responsible.

Representative HOLIFIELD. The retention of power to ship material within a State might well take care of a situation like that?

Mr. MCADAMS. Yes. But I think at any later date the Federal Government would still be able to step back into the picture if necessary.

Question 6. AEC contractors

Should such an amendment expressly exempt AEC contractors, at AEC installations and elsewhere, and/or subcontractors from regulation by State or local agencies?

Atomic Energy Commission contractors and subcontractors, doing work in non-Federal facilities, should not be exempted from regulation by State or local agencies. However, as we stated in point (e) of our answer to question 1, the regulation of the construction and operation of federally owned facilities is properly a Federal responsibility. Federal contract work performed in non-Federal facilities should be subject to the same State regulatory authority as all other work done at these facilities.

Question 7. Federal agencies

Should such an amendment delineate or modify areas of regulatory and promotional responsibility between various Federal agencies—such as AEC, Public Health Service, ICC, and so forth?

At present, the several agencies of the Federal Government having or assuming responsibilities in the atomic energy field seem to be carrying out these responsibilities satisfactorily and without conflict with one another. Therefore, there is no apparent reason to transfer existing repsonsibilities of any one Federal agency to another Federal agency. However, in the interest of clarity it might be desirable to delineate the responsibilities of the several agencies to avoid future conflicts.

Question 8. Model bills and standards

Should the AEC be directed to work continuously with the States in the development of model regulatory bills and standards? Should adoption of such standards, or other State action be made a prerequisite to transfer of regulatory (authority from the Federal Government to the States)?

The National Committee on Radiation Protection and Measurement is currently revising its model radiation protection code which was

published late in 1955. The AEC, representatives of the States, and other groups are cooperating in this effort and a good model probably will be completed in a few months. The Council of State Governments has developed a model atomic energy coordination act and other groups have prepared two or three models dealing with other phases of the subject.

Representative HOLIFIELD. How much progress has been made in the different States in accepting this model atomic energy coordination act? Can you give me specifically the number of States?

Mr. MCADAMS. I have that back in my statement. Fifteen States have passed laws to coordinate atomic developments.

Representative HOLIFIELD. Along this model line or along their own line?

Mr. MCADAMS. Very similar to the model. There actually is more than one model but, in general they all follow the same principles. So it is 15 States to date. Most of these have also appointed coordinators to handle this responsibility.

Our conclusion is that it would be inadvisable for the AEC, or any other group, to try to develop another set of model codes. More properly the AEC should lend its experience and assistance in improving the models now in existence or under preparation.

Standards dealing with practically all phases of the atomic energy field are being formulated under six sectional committees of the Nuclear Standards Board of the American Standards Association. The work under these committees is well organized and is proceeding as fast as is practical in such a new and highly technical field.

The ASA is the clearinghouse for standards in the United States and organizations of all types participate in its work. We believe that the procedures of the ASA are completely satisfactory for the development of atomic energy standards.

Model codes and standards should be considered as guides for agencies of Government at all levels. Adoption of such models and standards should not be a prerequisite for the transfer of responsibilities from the AEC to a State. A State should be permitted to develop its own regulatory plan, knowing that this plan will be reviewed by the AEC before the AEC releases its responsibilities to the State. Of course the AEC may lean heavily on the model codes and standards in establishing the criteria by which it will evaluate the regulatory plan of a State.

Representative HOLIFIELD. Your thought is that any release of responsibility on the part of the AEC should be done on a State-by-State basis?

Mr. MCADAMS. That is right.

Representative HOLIFIELD. With the approval of the standards and powers to implement which the State might make out in its case?

Mr. MCADAMS. This lets the matter proceed at a very nice pace.

Representative HOLIFIELD. With deliberate speed?

Mr. MCADAMS. Yes. To make sure you actually have good protection before you turn over the responsibilities.

Mr. TOLL. This is the approach followed by the AEC bill?

Mr. MCADAMS. Yes, sir.

Mr. TOLL. It does enter into individual agreements, and does have the advantage that the more backward States won't receive the responsibility as soon as the States that are better prepared?

Mr. MCADAMS. We believe this is a wise provision in the AEC bill.

Question 9. Licensing of materials and activities in States

If a State should fail to provide adequate health and safety measures to protect its citizens, should AEC be directed to refuse to grant licenses for radiation sources or activities in that State?

The licensing of materials and activities by the AEC should not depend upon the adequacy of State health and safety measures. There is no necessity for such a provision because the AEC would retain the responsibility for health and safety over those things which it continues to license. If refusal to grant licenses is meant to be a method of persuading the States to set up regulations then this policy seems entirely ill advised.

Under such a policy industrial and other organizations operating in such States would be penalized for matters over which they have no control. This would discourage them from engaging in atomic energy activities and seriously retard the growth of the whole atomic energy industry.

Representative HOLIFIELD. This is where you and I part company, my friend. You have been a pretty nice fellow up to now. But if there is any State that will not assume its responsibilities in this field to protect its inhabitants then in my opinion that State is not entitled to any atomic energy industry because it is more important that the lives of the people of that State be protected than it is for them to have an atomic energy industry.

As long as I have anything to do with writing the law it is going to be that way if I can make it that way.

Mr. MCADAMS. I think we agree that the people of the State must be protected. But we believe that there is no problem as long as the State has a regulatory plan that the AEC has agreed to. The State would have to have a plan before any responsibilities were turned over. Until the responsibilities were turned over, the AEC would still maintain control over the activities by licensee. The AEC would have the power to regulate as it does now.

So you really would not have a hazard to the people because you would still be controlling it through the Federal Government.

Representative HOLIFIELD. You just don't want them to say we won't grant you a license unless you protect your people, that is all.

Mr. MCADAMS. I want to make sure we are still able to get a license to do atomic energy work.

Representative HOLIFIELD. Regardless of whether you are complying with the proper standards or not that you have agreed to comply with?

Mr. MCADAMS. We want to comply with standards. In this case we would comply with Federal standards and not State standards and we would be most willing to do that. We simply would still like to be able to get a license as a business or as a research organization or as a hospital or any other group.

Mr. TOLL. You mean in effect that in a State which does not have satisfactory standards and regulations the Commisison or the Federal Government should continue to regulate?

Mr. MCADAMS. It will still have regulatory control. We believe that this would be adequate. We should still be able to obtain a license in these States if it is under AEC control. This is our position.

Representative HOLIFIELD. Providing that they would comply with the AEC standards?

Mr. MCADAMS. Yes, sir.

Representative HOLIFIELD. Maybe you and I get together after all.

Mr. TOLL. Is there a possibility that a plan could be entered and certain responsibilities turned over to a State and then for one reason or another it goes downhill to the extent that you then have a situation that might be hazardous to the people of that State and no Federal control?

Mr. MCADAMS. Of course, this is always a possibility. I rather think that the States tend to improve their laws and codes as they go along. As I finish off this statement here, I say the States are really concerned and interested in the development of a climate in which their citizens can engage in industry to their benefit. In fact, there is an actual competition among the States to formulate and refine State laws to create the best atmosphere for employees, employers, and the general public alike. This competitive process must be allowed to continue.

Representative HOLIFIELD. I think they are, too. We have had testimony before this committee by the AEC's own people that their own regulations have been broken repeatedly in this field. One of our first witnesses from AEC testified that in 50 percent of the cases that compliance was not as good as it should be.

Certainly if we are having trouble on the Federal level, to completely release this to the State with its lack of background and experience in this field, it might indicate we might have more trouble.

Mr. MCADAMS. We believe you should have control by the Federal Government until such time as the AEC concurs with a regulatory plan which the State has set up. We would not transfer the responsibilities to the States until we had a pretty good idea that the States were capable to handle them.

In summary, the Chamber of Commerce of the United States believes that:

1. The Atomic Energy Act should be amended to provide for the transfer of certain regulatory activity from the Atomic Energy Commission to the States.

2. Federal training of State officials should be continued at about the same pace at which it has been progressing for the last few years. Public health officials appear to be particularly well suited to receive this training.

3. An amendment to the Atomic Energy Act should apply only to those materials and activities now covered by the act.

4. Transfer of AEC responsibilities to a State should be carried out only after the AEC and the State have concurred on a suitable regulatory plan within the State.

5. The transfer of responsibilities in this way should not be subject to recall by the AEC.

6. AEC contractors in non-Federal facilities should not be exempted from the State regulations.

7. There is no reason to transfer existing responsibilities of one Federal agency to another Federal agency.

8. Adequate model codes and standards have been or are being developed in the atomic energy field and separate action by the AEC and

other groups not now in this area is unnecessary and would lead to confusion. Such models and standards should not be a prerequisite to the transfer of responsibilities from the AEC to a State.

9. The AEC should not attempt to force the States to develop regulations by refusing to grant licenses to industrial and other organizations in the State.

The chamber believes that these recommendations are consistent with:

1. Our traditional pattern of Federal-State responsibility.
2. The delegation of responsibility to the level of government that can best protect health and safety.
3. The elimination of overlapping jurisdiction of various levels of government.

That completes our statement.

Representative HOLIFIELD. Thank you very much, Mr. McAdams. It has been a well-prepared statement.

Mr. MCADAMS. Thank you, sir.

(The material referred to follows:)

APPENDIX

TYPICAL EXAMPLES OF STATE REGULATORY BILLS PERTAINING TO ATOMIC ENERGY

Air pollution: California Assembly bill No. 172, introduced January 12, 1959, would require the California State Disaster Council to evaluate all available information on the radioactive content of the atmosphere over California and to formulate standards for determining the degree of atmospheric radioactive content harmful to humans.

Burial of radioactive materials: Pennsylvania House bill No. 1077, introduced April 1, 1959, would authorize the State department of health to control the land burial of radioactive material.

Coordination of atomic energy activities: Kansas House bill No. 175, introduced January 29, 1959, provides for a coordinator of atomic industrial development and establishes a nine-member atomic energy advisory board.

General control: New Mexico Senate bill No. 61, introduced January 27, 1959, provides for a State radiation technical advisory council, authorizes the State department of public health to promulgate rules and regulations pertaining to radioactive materials and radiation equipment and requires the registration of radiation sources.

Hazardous household products: Under chapter 211, Indiana laws of 1959, approved March 12, 1959, effective January 1, 1960, a "hazardous household product" is any household product which may cause serious injuries as death by reason of its being, among other things, radioactive. Such products cannot be distributed or sold unless they have been labeled according to specification and registered with the Secretary of the State board of health.

Labeling: Washington House bill No. 437, introduced February 6, 1959, would authorize the department of labor and industries to require labeling of containers of hazardous substances including radioactive materials.

Licensing and registration of X-ray and radiation technicians: New York assembly bill No. 45 and senate bill No. 58, introduced January 7, 1959, would prohibit anyone from practicing as a medical X-ray or radiation technician on and after July 1 unless he is licensed and registered an an X-ray or radiation technician. The bill pertains only to those individuals carrying out procedures as prescribed by a licensed physician or dentist, or perform such duties as are required in the physical care of a patient.

Public utilities: Oregon Senate Joint Resolution No. 40, laws of 1957, adopted May 20, 1957, proposed that the State constitution be amended to permit the State "to develop water power and thermal and nuclear power within the State" either separately or in conjunction with the Federal Government, other States or private industry.

Record keeping: Connecticut bill No. 2588, introduced in the January session, 1959, would require employers to keep records of radiation exposure of their employees and on request supply copies of these records to the employees.

Transportation: Connecticut assembly bill No. 3883, introduced March 3, 1959, would include radioactive materials in the State's laws pertaining to the storage, transportation, and use of dangerous materials. The bill would give the commissioner of State police exclusive jurisdiction in issuance of licenses to persons who manufacture, keep, store, sell, or deal in radioactive material and would require persons who procure, transport, or use radioactive materials to obtain a permit from the commissioner of State police or the fire marshal of the town in which the material is to be used.

X-ray control: Vermont House bill No. 294, introduced March 17, 1959, would authorize the State Board of Chiropractic Examination and Registration to administer the taking of X-rays and X-ray protection in the ordinary course of its use by the chiropractic profession. The board would promulgate rules and employ qualified inspection personnel necessary to maintain accepted standards of radiation protection to the public.

Zoning: Arizona House bill No. 207, introduced February 10, 1958, would prohibit the construction of a missile or nuclear fission plant within a 60-mile radius of a city or town having a population exceeding 100,000 persons, or within a 40-mile radius of a community consisting of 10,000 or more persons and less than 100,000 persons.

Representative HOLIFIELD. The next witness is Mr. Oliver Townsend, Atomic Development Director for the State of New York.

STATEMENT OF OLIVER TOWNSEND, DIRECTOR, OFFICE OF ATOMIC DEVELOPMENT, NEW YORK STATE

Mr. TOWNSEND. Thank you, sir. I am pleased that the committee has given me an opportunity to be here today and to make this statement.

By means of this statement, I would like to do two things. I would like first of all very briefly to tell you something about the New York State Office of Atomic Development, and then I would like, also very briefly, to make a few comments on the bill for Federal-State cooperation that the AEC has proposed during these hearings.

The New York State Office of Atomic Development is a new agency created by a law—the State's first atomic energy law—that was passed by the legislature and signed by the Governor in early March. I was appointed director of the office and I was sworn in on the third of April.

The principal responsibilities of the office of atomic development, as described in the State atomic energy law, can be paraphrased as follows:

First: To advise and assist the Governor and the legislature in the development and promotion of a State policy designed to further atomic progress within the State.

Second: To coordinate the atomic energy activities of the State and its political subdivisions.

Third: To correlate the States' atomic energy activities with those of business enterprise, the Federal Government, and the governments of other States.

Fourth: To foster and support research and education through contracts and other means of assistance.

And fifth: To inform the public.

To assist the office of atomic development in the accomplishment of these missions, there was also established by the State atomic energy law an intragovernmental coordinating council to be chaired by the director of the office, and a nongovernmental advisory committee to be appointed by the Governor. The Governor on April 27 appointed

Francis K. McCune, vice president of the General Electric Co., to be the chairman of this committee. The other members are now in the process of being appointed.

Among the other provisions of the State atomic energy law is one requiring the agencies of the State and its political subdivisions to keep the office of atomic development fully and currently informed with respect to their atomic energy activities, and another providing that no rule or regulation primarily and directly related to atomic energy may take effect until 90 days after it has been submitted to the office, unless this requirement is waived by the Governor or director.

To carry on its work for the first year, the office of atomic development has had appropriated to it the sum of $100,000. It has also had appropriated to it $1 million to be used on a matching basis under a contract to be negotiated with the University of Buffalo for the establishment in Buffalo of a Western New York Nuclear Research Center.

As you can see, the New York State Office of Atomic Development is still very new and still in the process of being organized. A few days ago I appointed a deputy director, Jon D. Anderson, who since 1950 has been the manager of the Schenectady operations office of the AEC, and he will join the staff by June 1. When we are fully set up, we expect to have a staff of three or four professional people, depending upon need.

Now, in regard to the AEC bill, I would like to make just these few comments:

First: If this bill or something similar to it becomes law, and an agreement between the State of New York and the AEC can be negotiated under it, New York State could be ready within 6 months to assume the regulatory responsibilities from which the AEC proposes to withdraw.

I base this statement on assurances I have received from the State departments of health and labor and the Health Department of the City of New York, which would be the regulatory agencies involved.

Mr. TOLL. Mr. Townsend, the AEC bill in effect would propose or would authorize the Commission to enter into an agreement with New York State for the AEC to withdraw its responsibilities with relationship to radioisotopes, natural uranium, and thorium, and special nuclear material of an amount less than a critical mass.

Mr. TOWNSEND. That is right.

Mr. TOLL. Do you have any estimate of how many such sources there are within the State of New York now that you would then have to expand your capabilities to assume responsibility?

Mr. TOWNSEND. According to the latest figures from the Atomic Energy Commission in its last report, there are something like 560 places in New York where these things exist. The amount of regulatory burden that is imposed on the State by this, however, is but a fraction of the burden that it carries by virtue of its regulation of X-ray machines and natural sources of radiation.

So it is not a terrifically large increase.

Representative HOLIFIELD. You would put this supervisory inspection with your present inspection of the radiation field?

Mr. TOWNSEND. Yes.

Mr. TOLL. This would be primarily under the department of health so far as inspecting and endorsing is concerned?

Mr. TOWNSEND. Within an industrial facility it involves the State department of labor. Outside of an industrial facility and in medical facilities it involves the department of health, except for the city of New York, which has a separate health department and is autonomous in that regard. There are three regulatory agencies involved in the State of New York.

Mr. TOLL. I know your State industrial department and your State health department both have radiation codes.

Mr. TOWNSEND. That is right.

Mr. TOLL. Does the city of New York also have one?

Mr. TOWNSEND. Yes.

Mr. TOLL. And these three are the ones involved?

Mr. TOWNSEND. There are minor variations in these. They are essentially similar. These people work very closely and amicably together.

Mr. TOLL. Are these essentially similar to the Federal regulations?

Mr. TOWNSEND. Yes.

Mr. TOLL. In effect what you contemplate is taking on a slightly increased inspection job over these types of uses?

Mr. TOWNSEND. That is right. Now, to continue with the statement, my second comment on the AEC bill is that I believe that the AEC's wish to withdraw from these responsibilities is a correct one. I say this because the activities involved are more like the things over which the States already exercise control, such as X-ray machines and radium, than they are like atomic bombs, without which there would be no AEC. It seems to me that if the same Government inspector who comes into a plant or a hospital to check on X-ray machine can also at the same time check on the cobalt source, the public's best interests are being served, not only as human beings whose health must be protected, but also as taxpayers.

Third: I think it should be recognized that any State negotiating an agreement with the AEC under the proposed bill would be placing itself at a financial disadvantage vis-a-vis other States where the Federal Government would continue to perform this public service for the people of the State at the expense of the Nation.

It would therefore seem to make sense for any bill that may be reported out by this committee to acknowledge this fact in some way having to do with Federal assistance.

Representative HOLIFIELD. You would then not be completely in accord with the step-by-step approach on the basis of a State's ability to do the job?

Mr. TOWNSEND. I think this is probably an interim thing and it has to do mainly with training and to some extent possibly equipment. It is an interim thing as long as some States are carrying this load by themselves and others are not. There is a disparity here which I thought was worth pointing out.

Fourth: Although I have found no one within the New York State government who disagrees with the idea that the State can and—depending upon the conditions—should take over the regulatory responsibilities from which the AEC is proposing to withdraw, I have encountered a good deal of disagreement with those provisions of the proposed bill which describe the areas of responsibility exclusively assigned to the Federal Government, notably, for example, nuclear reactors.

This lack of agreement stems primarily from a deep and understandable desire on the part of the officials charged with the protection of the health of the people of the State to have at least a measure of control over all devices within the State that they believe might constitute a potential hazard to health.

A recognition of concurrent jurisdiction as between the State and the Federal Government would, of course, solve this problem. In the process, however, it might create greater problems having to do with the dual regulatory burden imposed on licensees and the possible creation of multiple and conflicting codes and standards.

Mr. TOLL. May I ask, Mr. Townsend, do you think there is any possibility when you have concurrent jurisdiction that you do not have responsibility fixed on either agency? If you have divided responsibility in the licensing of reactors, for example, might this less adequately protect the public than if responsibility is fixed clearly in that case at the Federal level?

Mr. TOWNSEND. What I was trying to do here was to point out a deep concern on the part of the health officials of the State who under this bill would have no voice that stemmed from legal authority in regard to the placement of reactors within the State.

They are deeply concerned about this, and they would like to have such a voice. It is an enormously complicated question how you give them this voice without creating these other problems. I am not sure that we have worked it out.

Mr. TOLL. Perhaps there should be a requirement along the lines that Mr. Holifield suggested, that the Commission would consult in site selection with the State people and the State government might even have a right of veto. But then once the site is selected and agreed to, the actual designs of the reactor and the final decision as to whether it is safe would rest with the Commission?

Mr. TOWNSEND. This would satisfy the health officials of the State, the right of veto on the initial site selection.

Representative HOLIFIELD. I am inclined to believe that might be a good provision. I want to explore it further to be sure that there is no complication that I don't foresee at this time.

Mr. TOWNSEND. One complication that I think it would be very desirable to avoid is that by virtue of this authority a dual mechanism is set up that licensees would have to go through as well as the Federal one in order to satisfy the State on its veto authority.

Representative HOLIFIELD. I would also want to be sure that such a provision would apply to the future and not be retroactive to sites which have already been selected by the Federal Government, such as Hanford, Oak Ridge, Savannah, and places like that.

Mr. TOWNSEND. Yes. On this there is another point I should make. What I am talking about here is licensees. The State has no trouble with the federally owned facilities where reasons are given of national defense and this kind of thing. It is bothered by the granting of a license to a private person to operate these facilities and not have a voice in the matter.

To continue with the statement, on the other hand it may be possible to solve this problem somewhat short of the recognition of concurrent jurisdiction by providing for a larger role for the States in the AEC's licensing proceedings than is presently provided for in the AEC bill, or by imparting to the AEC bill a clear interim character, or both.

I am not yet sure what the best answer is, but I am sure that there is a problem here, a very difficult problem that probably should be given more attention than it has yet received. In this regard, the New York Office of Atomic Development would like to be helpful in any way that it can through its advisory committee and coordinating council, both of which will be functioning in the near future.

Representative HOLIFIELD. It may be we will have to consider the problem of an interim period of time such as we did in the patent provisions where we set a period of 5 years which necessitated that Congress look at it again at that time to see how it works?

Mr. TOWNSEND. Yes, sir.

Representative HOLIFIELD. It might be well that we might consider some type of interim period for certain functions and then let the Congress look at it again at the end of that time?

Mr. TOWNSEND. This appears to be an interim problem because it is changing from year to year and perhaps an interim solution would be the best. This has been our thought.

I would like to make just one final point concerning the AEC bill. As you know, it is not the only bill dealing with atomic energy health matters that has been introduced in this session of Congress. There is also in existence a bill providing that the primary responsibility within the Federal Government for health protection against radiation hazards be vested in the U.S. Public Health Service rather than the AEC. This question is also currently under study in the executive branch of the Federal Government.

As a practical matter, there is no doubt that the existence of each of these two proposals complicates consideration of the other. It seems to me, however, that no matter how this other question is resolved, its solution inherently cannot be contradictory to the intent of the AEC's draft bill on Federal-State cooperation, and there would therefore seem to be no reason to postpone consideration of the AEC bill because of this other factor.

Whatever approach is taken, I would like to reaffirm to this committee New York State's offer and desire to be helpful. I am sorry I cannot at this time comment in a more detailed way than I have, but we expect in the near future to be in a position to add some detailed supplementary comments if you believe these would be useful.

Representative HOLIFIELD. We would like to have you take the bill, H.R. 7214, and analyze it section by section and give us your thinking on it.

Mr. TOWNSEND. We would be pleased to do that.

(Subsequently the following letter was received:)

STATE OF NEW YORK EXECUTIVE DEPARTMENT
June 17, 1959.

Hon. CHET HOLIFIELD,
Joint Committee on Atomic Energy
Washington, D.C.

DEAR REPRESENTATIVE HOLIFIELD: At the conclusion of my testimony on May 22, 1959, to the Joint Committee on Atomic Energy on the identical bills S. 1987 and H.R. 7124, you requested that I submit to the committee a section-by-section commentary. This commentary follows:

Section 272(a)

We agree with the stated purpose of the bill, except we believe that it should expressly recognize the traditional interests and responsibilities of the States in and over the protection of the public health and safety, and also expressly

recognize that any legislation adopted now should be only interim in nature and subject to amendment as the States increase their capabilities to regulate and license effectively in the field of atomic energy.

Accordingly, we suggest that paragraph (1) of this subsection be revised to read as follows:

"To recognize the interests and responsibilities of the States in the peaceful uses of atomic energy, including, but not limited to, radiation hazards regulated by the Commission under this Act."

We further suggest that paragraph (2) of this subsection be revised to read as follows:

"To recognize the need, and establish programs, for cooperation between the States and the Federal Government with respect to the control of radiation hazards during the present interim period during which the States are in the process of developing further their capabilities in the field of atomic energy."

We further suggest that paragraph (4) of this subsection be revised to read as follows:

"To establish interim procedures and criteria for discontinuance of certain of the Commission's regulatory and licensing responsibilities, and the assumption thereof by the States, recognizing that, as the States improve their capabilities to regulate and license effectively in the field of atomic energy, the consideration of additional legislation may be desirable."

Section 272(b)(1)

We believe the substance of this paragraph to be appropriate and desirable, and, as I stated during my testimony on May 22, 1959, we believe that New York State is qualified to assume responsibility for the activities described in this paragraph and could do so within 6 months.

Section 272(b)(2)

We believe it to be appropriate and desirable for the Commission to be precluded at this time from discontinuing its authority with respect to the activities described in this paragraph. We believe this with respect to subparagraphs (b)(2)(ii) and (b)(2)(iii) because these activities appear to be more the concern of the Federal Government than of the States. We believe this with respect to subparagraphs (b)(2)(i) and (b)(2)(iv) because the present disposition of competence as between the Federal Government and the States favors a continuation of Federal authority over these activities during the interim period to which, in our opinion, any legislation now adopted should apply. We further believe, however, that some States may develop during the interim period ahead sufficient competence of their own to enable them to exercise competent judgment in regard to initial site selection and should therefore be afforded an opportunity to exercise some authority over this activity. We therefore suggest the addition of a new paragraph (b)(3) as follows:

"Any agreement entered into pursuant to this subsection shall provide at the request of the State and subject to paragraphs (1) and (2) of subsection (d), that the Commission shall not consider or act upon any application filed with the Commission subsequent to the effective date of the agreement for a construction permit, or for a license in the event that no construction permit has previously been issued, covering any activity described in subparagraphs (b)(2)(i) and (b)(2)(iv), and shall not commence or cause to be commenced on its own behalf any such activity except for reasons of the common defense and security, until and unless the Governor of the State in which the proposed activity is to take place, or his duly authorized representative, shall have certified to the Commission that the State has no objection to the general location and features of the proposed site of the proposed activity. For the purpose of obtaining such certification, either the Commission or the applicant shall provide to the State a description of the general location and features of the proposed site, and the general size, nature, and design of the principal facility or facilities to be located on such site."

Also in regard to paragraph 272(b)(2), we understand that the Commission's authority under the sentence beginning with the word "Notwithstanding," would be in addition to any authority exercised by a State under an agreement with the Commission entered into pursuant to subsection (b). We believe this assignment of authority to reflect fairly and reasonably the States' and the Federal Government's interests and responsibilities in regard to these activities.

Section 272 (c), (d), (e), and (f)

We have no substantive comment on these subsections.

Section 272(g)

Since, in addition to the States and the Commission, other Federal agencies and private organizations have an interest and are now active in the formulation of standards for radiation protection, the committee might wish to consider revising this section to read as follows:

"The Commission is authorized and directed to cooperate with the States and other appropriate persons in the formulation of standards for protection against hazards of radiation to assure that State and Commission programs for protection against hazards of radiation will, to the extent feasible, be coordinated and compatible."

Section 272(h)

We agree with the substance of this subsection. However, we believe that it should in addition expressly recognize that any State entering into an agreement with the Commission under subsection (b) will be placing itself at a financial disadvantage vis-a-vis other States in which the Commission will continue to perform inspection and other functions for the people of that State at the expense of the Nation. For this reason, we suggest that the following sentence be added at the end of subsection (h):

"Any such provision of assistance by the Commission shall take into account the additional expense that may be incurred by a State as a consequence of the State's entering into an agreement with the Commission pursuant to subsection (b)."

Section 272(i)

We agree with the substance of this subsection, which we believe is desirable because it would tend to achieve uniformity as between the States and the Federal Government in regard to radiation codes and standards throughout the Nation.

Section 272 (j) and (k)

We have no substantive comment on these subsections.

Section 272(l)

We have no substantive comment on this subsection. We believe, however, that it should be renumbered 272(m) and a proposed new subsection (l) discussed below inserted immediately before it.

Proposed new section 272(l)

To impart to the bill an interim character which we believe to be appropriate and proper, we suggest that a new subsection (l) be inserted as follows:

"In recognition of the increasing capabilities of the States to protect the public health and safety from radiation hazards, the Commission shall submit to the Congress by June 30, 1964, a report containing an evaluation of the relationship of this section and other relevant sections to the capabilities of the States, together with any recommendations for amendments of this section and other relevant sections that the Commission may deem to be proper."

We appreciate this opportunity to present our views to the Joint Committee on Atomic Energy, and hope that the proposed legislation to which this letter refers will be enacted during this session of Congress so that States may have an opportunity to commence assuming authority in the radiation field commensurate with their traditional responsibilities and interests in regard to the public health and safety.

Sincerely yours,

OLIVER TOWNSEND, *Director.*

Representative HOLIFIELD. You may submit to us, if you can, within the next couple of weeks such an analysis.

Mr. TOWNSEND. We will do that. Thank you.

Representative HOLIFIELD. Thank you, sir, for your testimony.

It is 20 minutes to 1, so I think we will have to ask Mr. William Berman and Mr. Lee Hydeman of the University of Michigan Law School, atomic energy research project, to be our first witnesses at 2 o'clock.

(Whereupon, at 12:40, Friday, May 22, 1959, the committee adjourned, to reconvene at 2 p.m., the same day.)

AFTERNOON SESSION

Representative HOLIFIELD. The committee will be in order.

The first witness will be Mr. William Berman and Lee Hydeman, Michigan University Law School, atomic energy research project.

Gentlemen, you may proceed.

STATEMENTS OF WILLIAM H. BERMAN AND LEE M. HYDEMAN, CODIRECTORS, ATOMIC ENERGY RESEARCH PROJECT, UNIVERSITY OF MICHIGAN LAW SCHOOL

Mr. BERMAN. Thank you, sir. My name is William Berman. The gentleman with me is Lee Hydeman who appeared before your committee this past Wednesday. Mr. Hydeman and I are codirectors of the University of Michigan Law School's atomic energy research project.

The atomic energy research project is a privately sponsored, semipermanent undertaking, established by the Michigan Law School. Its goal is to pursue continuing studies of international and domestic legal and policy problems in the atomic energy field.

As you may know, several months ago we published a study entitled "Federal and State Responsibilities for Radiation Protection: The Need for Federal Legislation." The study was incorporated in your committee's print of selected materials as background for these hearings.

In the study we covered a great deal of background material and analyzed the many considerations pertinent to the problem of Federal and State responsibility for radiation protection. We also recommended what we believe to be the appropriate contents of Federal legislation at this time.

In lieu of attempting to summarize the contents or specific recommendations of the study, we should like to direct our testimony here today to two or three principal points which we believe to be of vital importance.

First, we believe it is essential that Congress act during this session to clarify the existing confusion regarding Federal and State responsibility in the radiation protection field. As you know, the Atomic Energy Act of 1954 does not deal, in any definitive way, with the authority of the States to control or regulate radiation hazards.

The act does give the Atomic Energy Commission board direction and authority to protect the health and safety of the public from certain radiation sources, but it is by no means made legislatively clear that the AEC's authority is exclusive.

The courts have not yet had occasion to rule upon the exclusivity of the AEC's responsibility and, as is so often the case, the legal writers are in disagreement.

When the Atomic Energy Act became law in 1954, the preemption question was not a serious one. Most States had evidenced little interest in the problem of radiation protection. However, the past 3 years have witnessed a considerable growth in State interest and activity and it is no exaggeration to say that we have reached a point where confusion may soon turn into chaos.

We have heard testimony during the past several days outlining the growth and nature of State and even local activity in the radiation protection field. At least one State is now in the business of licensing reactors and two others require advance permits for the use of radiation sources.

A number of others impose controls on federally licensed activities. While there is some evidence that State controls are not diverging too considerably from the Federal standards which have been established, no assurance exists that this state of affairs will continue where an integrated and coordinated program is lacking.

Perhaps even more to the point here, the continuing lack of an integrated and coordinated program can endanger the public health and safety, and in all likelihood, will impose an unnecessary burden upon the growth of the atomic energy industry.

There is no need to emphasize the desirability of effective health and safety control from the humanitarian standpoint. It would also seem to us to be self-evident, and this will indicate our view of the concurrent jurisdiction concepts, that the most effective health and safety control will be achieved where responsibility is clearly pinpointed.

The absence of pinpointed responsibility could well result in an Alphonse and Gaston routine, between Federal and State authorities, particularly with respect to the inspection function.

Mr. TOLL. You think that is now the case, that under existing law, without clarification, it is uncertain as to whether the Federal or the State Government has inspection responsibility?

Mr. BERMAN. I think that the Federal Government presently has the clear responsibility. I think the problem with legislating concurrency is such that you throw into doubt as to who has the clear responsibility. We heard testimony yesterday that having both the States and the Federal Government responsible at the same time tends to give double protection.

I think there is some serious question about that in our mind. We think it is equally likely that you might get less than single protection because of the fumbling that may go on, one leaving it up to the other to do the job.

Representative DURHAM. You think that exists in the present proposal that is before the committee?

Mr. BERMAN. In the present proposed bill, sir?

Representative DURHAM. Yes.

Mr. BERMAN. I think it certainly is not clarified in the present bill.

Mr. HYDEMAN. I think the intention, if I can say a word to that, Mr. Durham, is for exclusive Federal responsibility until the States assume responsibility but we think the bill could be made clear on this point. I think we agree with its intent.

Mr. TOLL. This would be in b(2) on page 3 of the bill, as to those activities that were not to be transferred to States, there could be a more express statement in the bill that these were exclusive Federal responsibilities. Is that your idea?

Mr. BERMAN. I think that is part of it, Mr. Toll. I think the other part is with respect to the b(1) activities. We will get to this point.

Mr. TOLL. very well.

Mr. BERMAN. In addition to the humanitarian need for protecting health and safety, the public acceptance of atomic energy is vital and we cannot afford accidents which will lessen its acceptability in the

public's mind. Moreover, the growth and development of the industry is more likely to flourish if it is free from conflicting, overlapping or duplicative controls.

Finally, we as a nation should not permit the inefficient use of highly skilled manpower that is implicit in a system which permits unnecessary duplication or overlap in governmental control.

These are the principal risks which may evolve from a lack of jurisdictional clarity. State activity in the radiation protection field during this past session of State legislatures reached a new peak. State agencies dealing with atomic energy are being formed; State codes and regulations are being enacted and developed; personnel is being employed to deal with the problems presented.

In short, commitments are being made and positions are becoming fixed. Further delay in clarifying the jurisdictional question and establishing the overall pattern of responsibility will only make the ulitmate task more difficult. We know enough now about the hazards of atomic energy and the technical and administrative means of controlling those hazards to establish a pattern of Federal and State responsibility that makes sense. Failure to establish that pattern promptly will lead to waste, burden, and perhaps even some danger.

The second matter to which we should like to address ourselves is really an extension of the first. As you are undoubtedly aware, a good deal of attention has been focused in recent months upon the question of jurisdiction for radiation protection within the framework of the executive branch of the Federal Government. While Mr. Hydeman and I have tentative views on this subject, we do not propose to address ourselves to the substance of that issue here today for two reasons:

First, our views are only tentative. We have not had an opportunity to give the problem as much study and thought as we think it deserves.

Second, and more important, we do not believe that the Federal jurisdictional question is an essential part of the problem of delineating radiation protection responsibility between the Federal and State Governments. The two jurisdictional areas undoubtedly overlap somewhat. The question is whether they are so intermeshed that they cannot be independently resolved.

Obviously, it would be ideal to resolve the jurisdictional problems of radiation protection at the Federal level and as between the Federal and State Governments, simultaneously. However, the desirability of such a simultaneous resolution of the two related problems is, in our opinion, more a matter of convenience than of substance.

The basic determination of the appropriate radiation protection role of the States probably will not be substantially influenced by which Federal agency is involved. Certainly, we do not believe that our own conclusions as to the role of the States would be affected if the radiation protection functions of the AEC were transferred either to a new independent agency or to the Department of Health, Education, and Welfare.

Representative DURHAM. What do you mean by new independent agency?

Mr. BERMAN. We were leaving this flexible for future judgment. We did not intend to suggest that was a solution to the problem. We were just using it to show possible alternatives.

Representative DURHAM. It would require creating a new agency?

Representative HOLIFIELD. I think the witness refers to testimony before the committee suggesting that there be a completely new agency set up or that we refer jurisdiction to the Public Health Service.

Representative DURHAM. To AEC or Public Health?

Mr. HYDEMAN. There are a variety of possibilities. You could have greater separation within the Commission by setting up a regulatory bureau of some sort. You could take the regulatory functions and place them in a brand new administrative agency. We did not want to preclude this possibility.

Mr. BERMAN. As I said, we are not directing ourselves to the substance of this problem today.

Representative DURHAM. It would seem to me very complicated because of the fact that the Public Health Service and the AEC are pretty well established in this field.

Mr. BERMAN. I think that fact is part of the consideration that would have to go into analyzing the whole problem at the Federal level—the fact that these two agencies are already established in the field. We do not propose either of these as a solution today. I would certainly want to give the whole problem a lot more consideration.

Representative DURHAM. I am sure you would, too.

Mr. BERMAN. For reasons which I summarized earlier, we believe it is vital that action be taken on the Federal-State jurisdictional problem during this session of Congress. We do not believe, however, that legislative action on the Federal jurisdictional problem is desirable at this session of Congress for two reasons.

First, if there is to be a significant reanalysis of the AEC's responsibilities and a possible shift of some of those responsibilities, we believe that a complete reappraisal of the atomic energy functions at the Federal level would be appropriate.

This would, of course, include consideration of the existing relationships between the AEC and the Departments of State, Defense, Commerce, and Health, Education, and Welfare, among others.

Second, we do not feel that there has yet been sufficient attention and study given to the problem of radiation protection responsibility at the Federal level.

By contrast, the Federal-State question has been studied carefully and thoroughly by a number of governmental and nongovernmental groups during the past 3 years and can be resolved now with reasonable assurance that the solutions will be sound.

Thus, while we recognize that the problems are interrelated, we conclude that this interrelationship is not sufficient to warrant delaying resolution of the Federal-State problem or rushing the resolution of the Federal organizational problem.

Finally, we should like to address ourselves to the substantive problem of the delineation of radiation protection responsibilities between the Federal and State Governments and to the most important differences between the recommendations contained in our study and the AEC's proposed bill.

Our study clearly recognizes that in many respects radiation protection is a public health and industrial safety problem and that protection of the public and employees, has, for the most part, been a traditional responsibility of the States.

We concluded, however, that certain aspects of radiation protection, such as reactor licensing, disposal of wastes in waters where interna-

tional interests become paramount, the establishment of basic maximum permissible exposure levels, and the interstate transport of radioactive materials, all require continuing control at the national level.

Because of overriding national interests, the limited availability of persons with the right skills, the need for uniformity to permit commerce to flow, or the need for uniform national concepts of acceptable risk, among others, the States cannot, in the specified areas, achieve the necessary goals as effectively as can the Federal Government.

We also concluded that those functions, the control of which are presently vested in the AEC but which are proposed to be exclusively vested in the States, should be transferred on a State-by-State basis on the theory that it would not be in the public interest to give up one control system without assurance that another equally effective control system was ready to replace it.

In these general respects the AEC's proposals appear to conform to our recommendations.

Beyond this, however, rather basic divergences become apparent. Most significant is the fact that the AEC bill does not clearly and exclusively reserve to the Federal Government those radiation protection functions which it believes, and we agree with that belief, will require continuing Federal licensing control for a good many years.

We well appreciate the fact that the concept of Federal preemption of governmental functions, particularly in an area of public health, is one which is likely to arouse a good deal of emotional opposition. But we do not believe that that warrants continued confusion and possible interference with national objectives.

Under the AEC's draft bill, there is no clear statement of exclusive Federal jurisdiction for reactor licensing, for example. One State already has, and others can be expected to impose their own licensing procedures, nearly doubling a burden that is not light when single.

While the AEC bill may, in effect, preempt the reactor licensing field, the lack of specificity in this regard will mean that some brave soul will have to litigate the issue and that ultimate determination will be left to the courts. We strongly believe that such determinations should be made by the Congress and not left to private initiative and expensive litigation.

Mr. TOLL. Just to tie that down to the AEC bill, subsection b(2) on page 3 of the bill starts off by saying that no agreement entered into, et cetera, shall provide for discontinuance of any authority of the Commission with respect to certain categories and included in that is the licensing of utilization facilities or reactors. But it does not state that the Federal Government shall have the exclusive responsibility in this area.

It is your feeling that there should be such a statement? Is that correct?

Mr. BERMAN. Yes.

Mr. HYDEMAN. I think this is right. We do not want to confuse the record. We think that the AEC in its statement made it reasonably clear that they thought they presently had exclusive jurisdiction. However, despite their beliefs the State of Minnesota has adopted a licensing scheme for reactors.

We are merely suggesting that the Congress, in clarifying the responsibility, should make this clear because I think it really is intended.

Mr. TOLL. In reading this bill, there is nothing to make the State of Minnesota think that they could not go ahead.

Mr. HYDEMAN. This preserves the status quo.

Mr. BERMAN. There is no improvement in the bill on existing confusion in this area.

I should like to emphasize, however, that our recommendation of Federal preemption of the control of reactor licensing, for example, does not lose sight of the vital interests which the States have or the contribution which they can make.

In order to assure State participation our proposal incorporates four recommendations.

First, and I want to emphasize the importance of this, we would like to see administrative procedures adopted for earlier and more extensive State participation in reactor siting determinations. This siting problem is a subject of vital health and economic interest to States and a basic aspect of the whole safety problem.

Representative HOLIFIELD. If you give the AEC exclusive licensing authority, would you then qualify that by requiring that the acquiescence of the States in the site only should be obtained?

Mr. BERMAN. No, sir, we were not talking about acquiescence in a formal sense. We feel that short of giving the States a right to veto whatever the Federal determination on site is, there are means by which the State can participate in siting determinations, add their knowledge and express their interest, short of having an overriding veto power over the Federal agency's determination.

Representative HOLIFIELD. As long as the States had no authority in the Federal act to veto, the cooperation could only exist on an advisory basis and not on a determinative basis unless you did provide for the filing of objections under the Administrative Procedure Act, a hearing under the Administrative Procedure Act before exercise, and so forth, or a right of appeal direct to the Joint Committee or something like that.

Mr. HYDEMAN. The State presently under the act has a right to enter as a party to any proceeding dealing with a reactor license and formally object and obtain review if it desires, in the courts. What we are saying is that as far as an administrative decision is concerned, the final responsibility has to be vested somewhere.

We are suggesting that it be vested in the Commission. However, in our study we went into the point of reactor siting and pointed out that the States do not play as much of a role today as they should.

We suggest that not only should the States be brought in on an informal basis at the site stage but the Commission's procedures on this matter should be changed. We feel that the Commission under its present regulations does not reach the site problem at an early enough stage.

The Commission does not require that the applicant submit his application for a construction permit before he commences any construction. It is left quite nuclear. As a result applicants in a number of cases have made substantial commitments on the site before they have come into the Commission for a construction permit.

Now, if the Commission were to require under its rules, that the applicant come in before he has made a firm commitment, if they brought the States in informally, because the States have a lot of information about local environmental and economic interests, then we believe that the procedure would be considerably better and that the State's interests would be adequately taken care of.

In addition we propose, as does the Commission, that at the hearing stage the State be able to participate either as a formal party or on some less formal basis where they have an opportunity to comment on the examiner's decision and ask questions.

Representative DURHAM. Do you think it is better to put that in the law or is it best to leave it to regulatory authority?

Mr. HYDEMAN. I think, Mr. Durham, our approach has been that on an administrative device such as this the law is probably adequate today. It is a question of getting the Commission to change its procedures. At this stage if the committee were to suggest that the type of procedure we are suggesting is a more desirable one, it is very likely that no legislation is necessary.

Representative DURHAM. I think I agree with that point. Of course, the decision should be made as early as possible even before the purchase of the site and everything else connected. I cannot understand why that cannot be done.

Mr. HYDEMAN. I think I would add that an argument could be made under the present statute that the intent of Congress by requiring a construction permit requires the Commission to make the determination before the site is frozen.

This becomes a difficult compromise, though, between moving the reactor program ahead and adequately protecting the safety of the public.

Representative DURHAM. We have had a little bit of experience with that problem.

Mr. HYDEMAN. I appreciate that.

Representative HOLIFIELD. We certainly have. I think the points are very well taken and this committee has admonished the AEC on this very subject. I think they have changed their procedures considerably on this very point. I believe they are beginning to realize that we can no longer have these industrial people go out and commit themselves to sites which have not been approved.

Any approval of the site should be on a tentative basis until all these factors can be looked into. I am strongly of the opinion that the State has a very vital interest in this problem as well as the AEC. I am very doubtful if the AEC should be the determining factor in the location of industrial type reactors.

I do not think I would apply that to the case of locating a Federal reactor for weapon purposes for national defense, for the production of plutonium or other material that might be needed in weapons. But certainly, in the whole field of industrial application, it seems to me that the States should have a pretty strong say as to where that site should be.

They have problems which the Federal Government cannot comprehend.

Mr BERMAN. I think we would like to emphasize our view, though, that the State should not have a final overriding veto in the granting of a license in this connection.

Representative HOLIFIELD. Of an industrial license?

Mr. BERMAN. That is right. I think our feeling is that the State interests can be well handled and given a sufficient consideration by this informal type of early participation. I think our view would be that if you gave the States a veto power here you would perhaps encumber the whole reactor licensing problem so much so to really interfere seriously with the reactor development program.

Representative HOLIFIELD. What you are saying in effect, then, is that the location of industrial type reactors would be such so that you would not allow the States as much right as it has in the setting up of an explosive plant or a noxious chemical plant or something like that.

On what ground do you draw the line?

Mr. HYDEMAN. I think we draw the line strictly on the radiation protection facet because the hazards evaluation of a reactor, which is so intertwined with the problem of site selection, is an exceedingly complex matter. You often are not in a position to make any final decision. You can give sort of a green light that it looks like it will be all right at the construction permit stage.

If you gave the State an absolute veto it seems to me they just are not in a position to properly exercise this veto because of the lack of technical competence in this field.

On the other hand, if a State had a zoning ordinance and said this partcular location was residential property, I have no doubt that even under what we are suggesting, that the State could veto for that purpose. We are just suggesting no veto on the radiation hazard aspect but a proper role in making sure their judgment is brought to bear at a very early stage and that they have continuing rights until both the permit and the license are primarily established.

Representative DURHAM. It is primarily based on competence in the final analysis?

Mr. HYDEMAN. I think so, sir.

Mr. BERMAN. I think there might be more to it than that. I would go one step further. I think there are national interests in the reactor development program so that even if the competence existed in the States, I would tend to feel that probably we ought not to subject a potential reactor owner to two sets of licensing proceedings.

I think giving the States a veto power might, in effect, amount to that. This could be pretty burdensome.

Representative HOLIFIELD. As a matter of fact, most of the people who do construct these projects clear it with their State bodies first as a matter of a practical approach.

Mr. BERMAN. But if a State had a veto, sir, you might get conflicting determinations between the Federal and State government.

Representative DURHAM. What you are saying is that the competence should not be a ruling factor in the final determination of the location of a reactor?

Mr. BERMAN. What I am saying is that final site determinations should be placed in a single authority.

Mr. HYDEMAN. Competence certainly is a very important factor—the factor of competence—as demonstrated by the two cases on which there has been some real question raised to date, namely, the Power Reactor Development Corporation case and the National Advisory Committee for Aeronautics case.

In both instances, the States came in but the States were not really in a position to make any decision. Therefore, they said that they hoped it would be safe before it was permitted to operate. But at the construction permit stage, they found themselves, because of lack of technical competence on the hazards evaluation on the details of the reactor, in a position where they could not really exercise a veto.

Representative DURHAM. Hoping that it will be safe is a pretty uneasy way to risk the public health.

Mr. HYDEMAN. I think if the State is in at the early stage of discussions and they have objections, they can make themselves heard effectively.

Mr. BERMAN. Second, we believe that the exclusivity of Federal licensing and enforcement jurisdiction over these activities should be limited to radiation protection, leaving the States free to control other health and safety aspects of such installations or activities.

Third, and as a corollary of the last point, we believe that the States should be free to require registration of, and to inspect for all purposes, federally licensed facilities.

Finally, we would suggest, as does the AEC's bill, State participation, as something other than a litigant, in Federal licensing hearings.

These four specific proposals for extensive State participation in the so-called continuing Federal control areas will give full recognition to State interests, enlist their talents, and should give the States a real sense of participation, all without imposing any substantial burden upon the industry.

It is our belief that failure by the Congress to preempt in this rather limited and qualified way will preserve confusion and may engender the risks I mentioned earlier.

The other major area of difference between our proposal and the AEC's bill relates to the jurisdiction over those radiation activities which are to be transferred to the States, prior to the time the actual ransfer of responsibility is accomplished.

Here again, we would raise the spectre of preemption and recommend that Federal legislation preempt temporary control over these activities, subject to vesting control in the States on a State-by-State basis. The purpose of this recommendation is twofold.

First, we believe that it is the only means of assuring an orderly transition during which the responsible authority is always identifiable.

Let me emphasize again the importance we attach to this ability to pinpoint responsibility.

Second, we believe that this interim preemption will maximize the State's incentive to take over these control functions quickly and effectively. We recognize, of course, that many States are already active and have built up staffs in the radiation protection field.

In order not to dislocate these people and disrupt their work, we would make the additional suggestion of permitting a grace period of 1 year before the interim Federal preemption becomes effective, giving the States ample opportunity to come forward with effective plans for assuming all, or at least part of, the responsibility.

We fear that the lack of such an interim preemption feature may encourage the States to dawdle, and certainly will result in their assumption of responsibility in bits and pieces, leaving the industry in a state of confusion and some types of radiation activity inade-

quately controlled because of uncertainty as to whether the Federal or State authorities are responsible.

One final point is our view that the area of Federal and State jurisdiction for radiation protection is one which will require cooperation and coordination at all levels of government and a sense of mutual understanding. In practice, neither the States nor the Federal Government are capable of doing an effective job alone.

This conclusion not only requires participation by the States in the area of activities controlled by the Federal Government, but also necessitates Federal assistance to the States with respect to the continuance and expansion of radiation protection research, the formulation of more specific safety standards and the training of radiation protection personnel.

I believe that this covers the points which we felt it was most important to make orally. We have prepared several pages of more specific, but brief comments on the AEC draft bill which we would like to submit for the record and for the committee's consideration.

These cover the lack of jurisdictional clarity in the AEC bill, inadequacies of mechanisms and inadequacies of State participation. We would be delighted to run through these or just submit them for the committee's consideration.

Representative HOLIFIELD. I think submission is in order and it will take some intensive study of the specific language before we would be in a position to question you on the legal phraseology.

(The document referred to follows:)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That—

SECTION 1. The following section be added to the Atomic Energy Act of 1954, as amended:

"SEC. 274. COOPERATION WITH STATES.—

"(a) The Commission is authorized and directed to cooperate with and to assist the States in order to protect the health and safety of the public from radiation hazards. To this end, the Commission is—

"(1) Directed to cooperate with the States in the formulation of standards for protection of the public from radiation hazards.

"(2) Authorized to provide, with or without charge, assistance in training the employees of any State or political subdivision thereof and such other assistance to a State or political subdivision thereof as the Commission deems necessary or appropriate.

"(3) Authorized to exchange information with any State subject to the provisions contained in chapter 12 herein.

"(4) Authorized to invite any State to participate in the conduct of a hearing held pursuant to section 189(a). The participation of any State official in such hearings shall be subject to rules and regulations issued by the Commission.

"(5) Authorized in the conduct of its licensing and regulatory responsibilities under this Act, to invite any State to participate and to enter into agreements with any State to obtain inspection or other services.

"(b) Except as provided in subsection 274(d), the Commission is authorized and directed to approve State plans, or amendments thereto, for assuming so much of the Commission's responsibility for regulating and licensing the processing and utilization of source, byproduct, and special nuclear materials as the Commission finds that the State is capable of performing in a manner which will assure protection of the health and safety of the public and will not unduly burden industrial progress.

"(c) The Commission shall establish by rule or regulation the information to be included in State plans, or amendment thereto, submitted for approval, taking into account such factors as (1) the adequacy and competence of the State's staff, (2) the adequacy of the means prepared for coordination within the State, with other States, and with Government agencies, (3) the adequacy of the State's regulations, and (4) the State's authority to administer the plans.

The Commission may establish a minimum scope of responsibility to be assumed by any State before a plan can be approved and, in addition, may require that a State plan should incorporate additional steps leading toward an early and complete assumption of the regulating and licensing responsibility permitted by this section.

"(d) The Commission shall not by approval of any State plan be deemed to have relinquished its exclusive authority to issue rules, regulations, or orders to protect the health and safety of the public from radiation hazards during the course of—

"(1) The construction and operation of production and utilization facilities;

"(2) The transportation of source, byproduct, and special nuclear material in interstate commerce;

"(3) The disposal of source, byproduct, or special nuclear material into such waters as determined by the Commission as requiring national control in the interest of international relations;

"(4) Such other disposal of source, byproduct, and special nuclear material as the Commission determines by rule, regulation, or order may create a general environmental hazard;

"(5) The sale or transfer by the manufacturer, processor, or producer of equipment, devices, commodities, or products containing source, byproduct, or special nuclear material;

"(6) The export from or the import into the United States of source, byproduct, or special nuclear material; or

"(7) The construction and operation of any facility owned by a Government agency and operated by a Government agency, or under contract with and for the account of a Government agency.

"No approval of a State plan shall be deemed to affect the authority of the Commission to issue rules, regulations, or orders to protect restricted data, to protect the common defense and security, or to guard against the loss or diversion of special nuclear material.

"(e) The Commission shall by rule, regulation, or order grant such exemptions from the licensing requirements contained in chapters 6, 7, and 8 and from its regulations as is necessary to give effect to the approval of any State plan. Such exemptions shall not affect the authority of the Commission to distribute source, byproduct, or special nuclear material in accordance with sections 53, 63, and 81.

"(f) The Commission shall not deny approval of any State plan, or amendment thereto, without affording the State prior notice and an opportunity for a hearing.

"(g) The Commission after a notice and opportunity for hearing may terminate or suspend its approval of any State plan upon a finding that such termination or suspension is required to protect the health and safety of the public.

"(h) The Commission shall issue rules setting forth the procedure to be followed in any hearing under subsection 274 (f) or (g). In any such hearing, a decision of the Commission shall be final.

"(i) Within one year after this amendment becomes effective, no State rule, regulation, or order to protect the public from radiation hazards incident to the processing and utilization of source, byproduct, or special nuclear material shall be valid except to the extent that such rule, regulation, or order is within the general scope of an approved State plan. *Provided, however,* That any State may—

"(1) Require registration of, and inspect, any activity involving the processing and utilization of source, byproduct, and special nuclear material, except to the extent that such activities are conducted in facilities owned by any Government agency;

"(2) Control the mining of source material; and

"(3) Take such action as it deems necessary in the event of an emergency, subject to rules, regulations, or orders issued by the Commission.

"Nothing in this Act shall be construed to affect the authority of any State or political subdivision thereof to regulate activities subject to the Commission's authority for purposes other than protection against radiation hazards or protection of the common defense and security."

SEC. 2. Section 11 of the Atomic Energy Act of 1954, as amended, is amended by adding at the end thereof the following new subsection:

"(bb) The term 'State' means any State, Territory, or possession of the United States, the Canal Zone, Puerto Rico, and the District of Columbia."

Representative HOLIFIELD. We appreciate your statement, Mr. Berman. I see by the title here that you and Mr. Hydeman are co-directors of the atomic energy research project of the University of Michigan Law School. Would you tell us something about that and how it was set up and what your budget is?

Mr. BERMAN. Surely, sir. I would be delighted.

Mr. HYDEMAN. Could I interrupt just a second, Mr. Holifield?

When I testified Wednesday this was put into the record. I would be glad to repeat it.

Representative HOLIFIELD. I was unable to be there. Could I be enlightened briefly?

Mr. BERMAN. Surely. The project was established approximately last September. The goals of it, as I indicated earlier, are continuing studies in both the domestic and international fields. The project is financed by the W. W. Cook fund, which is a law school endowment fund, by the Ford Foundation, and by one or two smaller grants.

Representative HOLIFIELD. Has a list of the people who have made those grants been made available to the committee?

Mr. BERMAN. No, sir. I would be glad to submit it. It is in our print of our document. It may have been printed as part of the committee print but I am not sure that part got in.

Representative DURHAM. You submitted that document for the record as I recall. I think you have done a fine piece of work, in my opinion, for the country.

Mr. BERMAN. Thank you, sir.

Representative DURHAM. Not at Government expense, either.

Mr. BERMAN. No, sir.

Representative DURHAM. Which you do not usually find around here. We usually have to pay for it.

Representative HOLIFIELD. The list of your supporters and the amounts that they have contributed is in the record there?

Mr. HYDEMAN. The amounts of support are not.

Mr. TOLL. Do you have any suggested language?

Mr. HYDEMAN. We did not in the suggestion submitted to you, put detailed language in. However, we did have a draft of language which incorporates all of our suggestions.

Mr. TOLL. Could you submit that for the record?

Mr. HYDEMAN. We would be glad to submit that for the record. We did not approach it as amendments to the Commission's proposals contained in H.R. 7214 because we only got those quite recently, and therefore, were unable to revise it in that time.

I think that our draft expresses all that we have suggested today and also contains a couple of pages on the problems of site and the problems of what areas we are talking about in terms of preemption.

(See pp. 402–403 for draft bill submitted by witness.)

Representative DURHAM. You raised the point that has concerned me all the way through this thing, and that is this matter of jurisdiction. It is not so easy of solution.

Mr. HYDEMAN. No. I think in the document we are submitting for the record that Mr. Toll referred to we point out that certain areas obviously cannot be clarified just by legislation. All we are suggesting is going as far as, at least, we were able to go in clarifying responsibilities.

If you get a State that sets up a zoning ordinance against reactors, I think this becomes a rather difficult case. I do not think you can specify each fact situation that is going to occur.

Representative DURHAM. Why did you suggest the 1-year compliance?

Mr. BERMAN. That was principally to give the States an opportunity. If you provide for preemption in this area, if the preemption is immediate, our concern was that the States with existing radiation protection groups would suddenly find themselves with no functions until a plan was submitted and approved.

There is a possibility that the State legislatures might cut off funds and the executive branch of the State would tend to lose these people. Therefore, we thought a grace period of a year would allow those States that were in business or ready to go into business an opportunity to come in with a plan during the year's time and avoid this dislocation problem.

Representative DURHAM. Personally, I think it is a good suggestion. I can see the confusion that might occur.

There are 8 or 10 States who have already adopted this so-called plan, whereas the others have not. It might be confusing at the Federal level, too.

Representative HOLIFIELD. Is it your opinion that there should be an enlarged training program at the expense of the Federal Government of personnel?

Mr. BERMAN. Yes, sir.

Representative HOLIFIELD. How do you feel that should be done? On the basis of training only individuals or on the basis of training key individuals in each State and letting them do the training of the State personnel?

Mr. BERMAN. I think this depends, sir, on what the personnel needs of each State are. I think for many of the functions there may be a tendency to exaggerate the degree of training that is necessary. Our understanding is that a good health physicist can be trained—I don't mean to underestimate the personal talent required—in a comparatively short period.

If one or two keymen are trained for each State, they then can probably take over the job of training inspectors, providing that sufficiently good inspection manuals are developed to assist the inspectors.

Representative HOLIFIELD. Did you consider at all the capacity of training of the local State universities?

Mr. HYDEMAN. I think the Commission's present program whereby they have offered to send a State man to a university—I don't think a separate training school is necessary; I think universities like Michigan and a number of others have specialized on health physics within their schools of public health—and the Commission's program, as I understand it, is to offer to the States to train one or two people from each State on this intensified basis for 1 or 2 years.

Representative DURHAM. That sort of program is giving grants to the universities to train these people.

Mr. HYDEMAN. They also adopted last year, I believe, Mr. Durham, a fellowship program and they were handling the State training under the fellowship program.

I think the problem has been, as I understand, last year they only had four people from the States under this fellowship program and they were all from one State.

Representative HOLIFIELD. That betrays a lack of interest on the part of the States, does it not?

Mr. HYDEMAN. It probably works both ways. I think it may have to be a more stepped up program from the Federal level. I think the State interest will be increased if the States have an opportunity to get jurisdiction in this area. It is somewhat difficult to determine exactly why there should be a lack of State interest.

Representative DURHAM. There is quite a sum requested this year for this type of work?

Mr. HYDEMAN. That is right.

Mr. BERMAN. We are not sure which comes first, the chicken or the egg, on this. To go back to your original question, we would favor continued expanded Federal assistance to the States to the extent that this appears to be necessary to get them going.

Mr. HYDEMAN. The Public Health Service, I understand, does have a short course in Cincinnati, which is very good for the people who will be at the inspection level under the one or two health physicists at the top.

Other people could either be trained there or on the job.

Representative DURHAM. We more or less have to train these people in the public health schools throughout the country.

Mr. HYDEMAN. I think this is correct, sir.

(Letter dated May 28, 1959, from William H. Berman to Hon. Chet Holifield follows:)

ATOMIC ENERGY RESEARCH PROJECT,
THE UNIVERSITY OF MICHIGAN LAW SCHOOL,
Ann Arbor, Mich., May 28, 1959.

Hon. CHET HOLIFIELD,
Joint Committee on Atomic Energy,
Congress of the United States, Washington, D.C.

DEAR MR. HOLIFIELD: This letter will supplement our testimony before the Joint Committee last Friday, May 22, 1959, with respect to your question about the nature and budget of the University of Michigan Law School's atomic energy research project.

The atomic energy research project was established in September 1958 by the law school in order to expand the school's previous activities in the atomic energy field. Prior to last September, Dean Stason and three other members of the regular law school faculty had been actively interested in the legal problems of atomic energy, but felt that they could not give these problems the time which they deserved. Consequently, Mr. Hydeman and I were given the opportunity of coming to Michigan as full-time directors of the new project.

The project was established with the objective of undertaking continuing studies of legal and policy problems in the domestic and international phases of atomic energy. The initial financing is on a 4-year basis. This financing has been supplied from three principal sources: calculated over the 4-year period, the Ford Foundation provides 50 percent; the W. W. Cook Law School Endowment Fund provides 37½ percent; and the remaining 12½ percent of the funds are derived from the Michigan Memorial Phoenix project. As you probably know, the Phoenix project was established primarily to pursue research and educational and training activities in the nuclear field. Some portion of the funds which come to us from the Phoenix project are supplied by the Detroit Edison Co., earmarked for law school atomic energy research. We recently received an additional contribution, also through Phoenix, from Glen L. Coulter, a Detroit attorney and a graduate of the law school. These are the sole sources of our funds to date. All of these names, except Mr. Coulter's, were set forth in our publication on the Federal-State problem, but were not included in the committee print which is a result of the exclusion of the cover page, the fore-

word, and the page containing acknowledgments. None of our financial sponsors has imposed any conditions upon the grants made, except that the Ford Foundation grant was made specifically for research in the international field.

Of course, the views expressed in our studies are those of Mr. Hydeman and myself, and we do not clear any of our work with those who have been kind enough to make gifts to the law school for the support of our project.

Under the organization of the project, Mr. Hydeman and I have the primary responsibility. There is a project executive committee chaired by Dean Stason, upon which Prof. William Bishop, Prof. Samuel Estep, Prof. William Pierce, Prof. Eric Stein, and Mr. Hydeman and I serve. The purpose of this executive committee is to make major policy decisions regarding the nature and scope of studies to be undertaken within the project.

In addition to the executive committee, we have established an advisory committee composed of the following individuals:

E. Blythe Stason, dean, University of Michigan Law School, chairman, Dr. John C. Bugher, The Rockefeller Foundation, Prof. David F. Cavers, the Harvard Law School, Mr. Walker Cisler, the Detroit Edison Co., Mr. Kenneth E. Fields, the International Standard Electric Corp., Mr. Charles F. MacGowan, the International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers, William Mitchell, Esq., attorney at law, Mr. Clark C. Vogel, U.S. Atomic Energy Commission, Prof. Abel Wolman, the Johns Hopkins University.

This advisory committee is to meet once or twice each year, for the purpose of examining and opining upon the project's long-range goals and the utility of specific studies which are in the planning stage.

As Mr. Hydeman indicated during the course of his appearance before the committee on May 20, 1959, we are presently engaged in a study relating to the need for, and the possible methods of achieving international control over the health and safety aspects of the sea transport of radioactive materials, the sea disposal of nuclear waste products, and the nuclear propulsion of vessels. We are also in the planning phase of a study which will examine the appropriateness of the present organization, at the Federal level, for the promotion, operation, and control of the various aspects of our national atomic energy program.

We trust that this will provide you with sufficient amplification of our May 22, 1959, statement, and we would be delighted to have this letter incorporated in the record of the hearings.

Respectfully yours,

WILLIAM H. BERMAN.

Representative HOLIFIELD. Thank you very much, gentlemen. The next witness is Mr. Otto Christenson, Conference of State Manufacturers Associations.

STATEMENT OF OTTO F. CHRISTENSON, EXECUTIVE VICE PRESIDENT, MINNESOTA EMPLOYERS ASSOCIATION, REPRESENTING CONFERENCE OF STATE MANUFACTURERS' ASSOCIATIONS

Mr. CHRISTENSON. Thank you, Mr. Chairman.

Mr. Chairman and gentlemen of the committee, my name is Otto Christenson. I am executive vice president of the Minnesota Employers Associations. I am appearing on behalf of the Conference of State Manufacturers Association. The conference includes 38 State manufacturers associations located in the 38 principal industrial States of the Nation, with a combined membership of over 55,000 industries throughout the United States.

On March 19 of this year I appeared before your Subcommittee on Research and Development of the Joint Committee on Atomic Energy and then gave a somewhat detailed statement of whom I spoke for and what the ideas of industrial management are in the fields of employee radiation hazards and workmen's compensation. To save time I now request that I be permitted to file copies of the statement I then gave which sets forth management's thinking in those

two fields. We would appreciate it if the members of your committee would take 5 minutes to read it, either today, or at your desks later.

Representative HOLIFIELD. It will be accepted.

Mr. CHRISTENSON. Thank you.

(The document referred to follows:)

You are fully familiar with the fact that up to 1954 the nuclear energy field was a Government monopoly devoted to the military and defense needs of the Nation.

Since 1954 the Atomic Energy Act has opened the field of the use of radioisotopes to all American industry. Some 10,000 scientists, engineers, and technicians now working in nuclear energy for private industry in the United States are doing a splendid job of developing commercial uses for radioisotopes.

They are now able to "tailor make" radioisotopes having almost any desired combination of radiation type, energy, and length of existence of around 900 known kinds of radioisotopes for atoms giving off radiation, and of these well over 100 are readily available commercially.

Over 4,500 licenses have been issued by the Atomic Energy Commission. Over 1,500 of them have been to priavte industry. In less than 5 years isotopes have been developed for use in the petroleum industry, the chemical industry and such industries as tobacco, rubber, paper, and many others.

Most management in the industries using radioisotopes now have arrived at a judgment in the field of Federal-State relationships. Putting it in most general terms it is that at least for some time to come reactor licensing, regulation and supervision should remain with the Federal Government and that the Federal Government continue to control the export and import of source special nuclear or byproduct materials or the disposal at sea of these materials.

Some people in this field believe that a time limit should be expressed in the law so that a review of the situation in this area would be specified for a certain time.

Also some people believe there should be greater clarification of the siltuation regarding byproduct materials produced at reactor sites, and say the current language is somewhat vague in this respect.

But as to the use of radioisotopes, management believes the licensing, administration of regulations, and establishment of rules should be turned over to the States as soon as the States set themselves up to handle the situation.

Rules, regulations and inspection are necessary and they are tied up with State functions in the fields of safety, health, education, transportation, water and air pollution, insurance, fire hazard control, port authorities, workmen's compensation, etc.

We believe better progress will be made under State operations where regulations can be issued from time to time by State boards of health, industrial commissions, departments of labor, departments of safety, etc., who will be in position to issue flexible rules and regulations, changing them from time to time if local situations recommend it in this transition stage of the growth of the industry than by any rigid Federal controls or regulations.

We just don't think it is practical for the Federal Government to seek to regulate and inspect the thousands of industrial uses of radioisotopes in the coming years. Let me cite a few illustrations to demonstrate the situation.

In the manufacture of cigarettes, shredded tobacco is pressed into a long, continuous, paper-covered rod. This rod is inspected by a radioisotope gage. Radiation from a source within the gage penetrates the rod and instantly detects any areas that have too litle or too much tobacco. This is used to control automatically the "firmness and fullness" of packaging. It must be emphasized that this procedure is absolutely safe—the radiations from radioisotopes do not make other atoms radioactive and the isotope source itself its leak-proof. Such gaging is now used on about 90 percent of all U.S. cigarettes.

When you open a can of noodle soup today you can be sure of finding more than just broth. For, in its manufacture, consistency of the noodle soup was monitored by the quick thinking automatic rays to assure that each container has the same proportions of noodles, meat, and broth. You may also have noticed that you no longer have to pound the bottom of the catsup bottle to make it flow. Here again atomic rays control the consistency of tomato paste during the mixing of all ingredients and filling of the bottle.

You will also find that you are not shortchanged when you open cans of liquids of all types—beer, detergents, etc. The level of the liquid is measured by a sensitive radioisotope level gage during the filling operation and all improperly filled cans are detected and corrected.

Radioisotope gages have universal application, so that almost every item in your kitchen may have been produced with their aid. They are used to control the thickness of soda cracker dough in the bakery and the fat content of canned meats for baby food. The cardboard cartons and paper bags, in which you bring home your groceries, are controlled in their manufacture so that packages are more uniform and less likely to tear. Almost everything manufactured in sheet form—paper, plastic, metals, adhesive tape, rubber, sandpaper, etc.—is now improved by isotope gages.

Radioisotopes are helping us not only by their use on the production line, but perhaps more importantly, by the information they give the engineer in improving the design of the things we use. The familiar use is the study of wear of piston rings, valves, crankshafts, and other parts of our automobiles and lawnmowers by making a piston ring radioactive, for example, and measuring the almost infinitesimal amount of radioisotopes that appears in the crankcase oil after a trial run of the engine. It is possible to determine the rate of wear in a few hours rather than being required to run the engine for many days, even months, before the wear could be measured. Improved lubricants as well as engine design can be very readily evaluated by this means.

Another appliance whose design is continually being improved by radioisotope tracer studies is the washing machine. By using various kinds of slightly radioactive dirt to soil a variety of clothes, industry can determine the efficiency of the washing operation, the effectiveness of various soaps and detergents or even the ability of different textiles to shed soot, grease, and dirt.

Radioisotopes are used in various ways to improve the growing of food crops prior to processing. Tracer experiments are rapidly adding to our knowledge of how best to fertilize. Radioisotopes also help the farmers develop new varieties of crops. This is possible because intense radiation causes mutations in growing parts of plants and in seeds.

In North Carolina, a new variety of peanuts has been developed through radiation mutations. This has a much stronger hull and can be handled with less breakage than the usual variety.

Radiation is also helping agriculture eleminate insect pests. The most striking success to date has been the eradication of the screw-worm fly from Florida and the entire Southeast United States.

A very great area in which radioisotopes are benefiting mankind is in medicine.

In England for two shillings you can buy a book such as the one I am now holding in my hand, giving an index of industrial uses of isotopes at work. This booklet, as you can see, has single space printing and lists hundreds of articles on 17 pages, listing the industrial use of isotopes in such things as agriculture, aircraft, beverages, building materials, chemical industry, coal and coke, electrical engineering, fertilizer, food, glass and glass containers, jewelry, laundry, leather, linoleum, oil refining, paint and varnish, paper and printing, photography, plastics, refrigeration, rubber, surgical instruments, textiles, wood products, tobacco, etc.

Once we get an understanding of the wide use of radioisotopes in industry today, and just a little comprehension of the tremendous industrial uses of isotopes in the next 10 years, we commence to understand why the businessman who has given some thought to the subject, believes that it is impractical for the Federal Government to license, issue rules and regulations, and inspect operations to see that these rules and regulations are complied with. To him it is simply not practical that any Federal agency could properly keep up with this responsibility without duplication and overlapping on almost all of the departments and commissions and employees of all of our States.

Obviously in 1954 the States were not prepared or sufficiently knowledgeable to license or inspect users of byproduct materials for example in the quantities available from the Commission. It was appropriate that the Atomic Energy Commission license users of those materials and inspect facilities to determine that the terms of the licenses were being met. However, today the situation is different: about 4,500 individuals or institutions have been licensed, of which over 1,500 are industrial firms. This number is growing constantly.

We believe it is unrealistic to expect that the Atomic Energy Commission can keep up with this situation, particularly as regards inspection of facilities. On the other hand, the individual States can perform this type of function within their own borders. They have departments already established for this.

In our opinion, efforts should be made to avoid unnecessary regulatory burdens upon industry, or, by all means, to avoid duplication or overlapping of Federal and State regulations.

We do not believe the Federal Government should continue its regulations in those areas of the nuclear field such as possession, transfer, use of source materials, byproduct materials or reasonable quantities of special nuclear material unless there are clear and overwhelming reasons for so doing. We do not believe such reasons exist in the above area.

Thirty-eight States have already acted to assess their responsibilities in the nuclear field, either through study and coordination or through some sort of radiation hazard control.

This whole subject dramatically illustrates the need for some such legislation as is embodied in H.R. 3 and S. 3 which proposes "to establish rules of interpretation governing questions of the effect of Acts of Congress on State laws." This legislation would deal with those areas where power is vested both in the Federal Government and in the States.

The problem before you today serves as a specific example of a situation that, in our opinion, H.R. 3 and S. 3 would do much to correct.

To date there has been no official interpretation of the extent to which the Atomic Energy Act of 1954 preempts to the Federal Government the historic rights of the States to regulate health and safety of the public within their borders. The question that the act raises is implicit in the amendment that the Atomic Energy Commission has submitted to the Joint Committee.

H.R. 3 and S. 3 would (1) require Congress to express its purpose clearly when enacting legislation and (2) require the Supreme Court to follow its own rule and construe Federal statutes as displacing State power only where Congress expressly stated its intention so to do.

So we believe such legislation is desirable as a matter of principle and that the problem before the committee today is a clear illustration of the need of such legislation.

Thank you.

Representative HOLIFIELD. Thank you, Mr. Christenson.

Are there any questions?

Representative DURHAM. You have made a very clear explanation of what is being done with this radiation material. The only thing that worries me is that you recommend that this be completely turned over to the States with as little regulation and supervision as possible. I might say I would agree with that, also.

You state the fact that you do not believe these regulations that are in existence today are necessary. What do you base that on? Do you base that on being a manufacturing group?

Mr. CHRISTENSON. Mr. Durham, I have been in this field only about 3 years and believe me, I don't know all the answers. I have been amazed as I have gotten into this field with industry, at the tremendously wide use of radioisotopes. I do not know anything about nuclear reactors except in substance when I have gone to Government installations in various places.

I, and the people with whom I have talked, still have the general feeling this is a different problem and a different hazard and a different situation than the wide commercial use of radioisotopes. There the general feeling is that as soon as a State is qualified, as soon as a State has the setup to take over the investigation and the licensing and the inspection and the safety hazards and the health hazards and the air and water pollution, in this whole broad field, it has got to be by the State.

We do not think 100,000 people working for the Federal Government could properly inspect what you will have in 10 years.

Representative DURHAM. I see your point. At the present time there are 4,500 licensees.

Mr. CHRISTENSON. Yes, sir. This is only 4 years old. Think what it will be in 10 more years.

Representative DURHAM. I do not think the public realizes what it is being used for.

Mr. CHRISTENSON. I do not think they do. We have sufficient confidence in the Congress and the Atomic Energy Commission to use good judgment. We are not afraid that they are going to do something wrong. We feel, in general, that if the Atomic Energy Commission feels that a State is set up so that it can do its own regulating and inspection in this broad field, why not let them do it?

Representative DURHAM. I agree with you if it can be done with safety. I believe it was testified the other day that at the present time 95 percent of it is already being used by private enterprise and 5 percent is being produced by the Federal Government.

Mr. CHRISTENSON. Last month on April 14, Paul Aebersold, who is the Director of Isotopes Development of the U.S. Atomic Energy Commission, gave a talk in New York City.

Representative DURHAM. I read that.

Mr. CHRISTENSON. I would just like to read to you one sentence in his talk on safety in which he says in fact:

> If we look at all the accidents that have taken place, we find that there has never, since the beginning of the Manhattan Project Atomic Energy era, been one accidental death caused by radioisotopes.

Representative DURHAM. We are very proud of that record on this committee.

Representative HOLIFIELD. I point out to you that it was done under Federal regulation and inspection and not State regulation and inspection.

Mr. CHRISTENSON. That's right. I am trying to give you the thinking of industry today. It is that this can be done by the industrial commissions, by our safety departments, by our health departments, by our stream and pollution departments, and so forth.

As this thing grows, there is only one practical way to meet it and in the field of radioisotopes, as soon as the States are set up to take care of it, to do it.

Representative DURHAM. You agree there has to be competency in the States and at the State level?

Mr. CHRISTENSON. Certainly. We have had our troubles out in Minnesota and I have been at many hearings and people have all kinds of ideas that range to where they think they will have fallout all over the State or the whole State will be blown up because you have a radioisotope measuring a piece of steel at Minneapolis-Honeywell.

Representative DURHAM. I think the public has forgotten the great benefits they derive from them.

Mr. CHRISTENSON. That is right. Thank you very much.

Representative HOLIFIELD. Thank you, sir.

Our next witness is Prof. George Frampton, University of Illinois Law School. I might say we have received the submission of your two articles. They are printed in the compilation of preliminary material, Professor. We felt that they were very good and we are glad to have you before us as a witness.

STATEMENT OF GEORGE T. FRAMPTON, PROFESSOR OF LAW, UNIVERSITY OF ILLINOIS COLLEGE OF LAW

Mr. FRAMPTON. Thank you, sir. My name is George T. Frampton. I am a member of the bar of New York and Illinois and a professor of law at the University of Illinois College of Law, which was one of the first law schools to sponsor a seminar in the problems of atomic energy law in its regular curriculum. I am a consultant member of the Illinois Atomic Power Investigating Commission, a member of the advisory group of Subcommittee 10 of the National Committee on Radiation Protection and Measurements (NCRP), and a member of the informal panel which advised on these hearings of your committee. I do not represent any person, firm, or client who has any interest in any matter under consideration by this committee and my views, therefore, are at least disinterested.

At the core of Federal-State complexities in radiation control is one problem that is detachable for examination. That is the problem of determining maximum permissible exposure levels of ionizing radiation as a matter of law, and this statement is confined to that problem.

We all know that the scientific and medical knowledge which must forerun such determinations is fragmentary, based largely on observations of lower organisms, and highly tentative, even as to the relatively immediate effects of radiation. Elsewhere I have contended that this state of our scientific knowledge, and the need for more of it, the further objective of minimizing genetic harm, the cumulative impact of radiation from a variety of different sources, the possibilities of interstate contamination, the difficulties of effective monitoring and recordkeeping, the mobility of the population, and the future need for international uniformity of regulation, all point to a present need for a single, national determination of maximum legal levels or standards. My arguments along those lines are more fully quoted at pages 314–317 of the joint committee print containing selected materials for this hearing. Accordingly, I believe that so much of the bill proposed in March 1959 by the Atomic Energy Commission as would hand over to some States, by agreement or cession, authority to determine such standards, is unwise and should not be enacted, and I would like to comment, in support of my position, on the present efforts of the NCRP, the AEC, and the States.

The NCRP has performed a great task in standardizing measurement terminology, pooling expert evidence, judgment, and opinions from diverse fields, and undertaking to reach a consensus on the known physical and medical effects of ionizing radiation. To give some usefulness to its work, however, its hand has been almost forced to lay down fixed standards, and from there it has been led almost unwillingly to propose legal standards in the form of suggested model radiation regulations for the States. These regulations have been swallowed down, sometimes whole, by several States, partly from their hunger for authoritative direction and uniformity.

I do not criticize the NCRP work, in which I have participated in a very small way, nor any of the highly qualified men who make up its committee and staff, but I do believe that in backing itself into the drafting of model regulations, it has backed itself into a brier patch. The NCRP is composed of specialists eminently qualified for tech-

nical, scientific, and medical standard making. In that area, because of the newness and meagerness of scientific and medical evidence, they are buffeted by even more than the usual difficulties of formulating national and international agreement on terminology and measurement. Translating the findings they can assemble into definite conclusions that could guide voluntary safety measures is difficult enough. It involves, in some instances, picking a point which could later be shown to have been too low or too high on a continuous spectrum. Embodying such points into recommended legal rules and formulating sanctions to enforce them is quite another matter. While it is imperative that anyone attacking the legal aspects of this problem have a sensitivity to the implications and limitations of the scientific findings, a corollary is also true. Anyone who recommends legal standards of conduct, even though they arise out of and bear the most intimate relationship to scientific knowledge, should be aware of the implications and limitations of Government regulation generally, and I fear that most of the men in NCRP are not by either training or interest inclined to draft rules or grapple with the problems that such drafting entails. Their work is indispensable undergirding for law, but I doubt whether it should constitute a model for the law itself in any field.

Moreover, as with the scientific and medical approaches, the legal approach to regulation in the field of ionizing radiation presents unusual, if not unique, legal problems beyond those usually encountered in ordinary Government regulation. Here the initial objective is the difficult one of defining as a matter of law a level of unseen and unfelt radiation above which no person shall be exposed, from any sources, internally or externally, occupationally or otherwise, suddenly or slowly, in one accident or over a lifetime, as an individual sufferer, or as a gene-bearer in the total population. If a true scientist were to say that such a level cannot be selected consistently with present scientific knowledge, the lawmaker must nevertheless select an arbitrary point or abandon his lawmaking. If a scientist were to say that such a point is probably too low, the lawmaker must have a reason for being overconservative. If the point is probably or even possibly too high, the lawmaker must calculate the degree of the risk of possible loss against the benefit presumably to be derived from legal permission to operate at the riskier standard. The determinations which involve this weighing, this balancing, and this calculation of conflicts, risks, and interests are neither scientific nor strictly legal; they are novel public policy questions to be determined, in our society, in the last analysis, by someone or some group having continuing access to current scientific developments, but who is ultimately responsible to the people.

From the point selected as the maximum dose for the individual, the drafter must then work back to implement the level selected by regulating the source of the radiation, where feasible; by setting up means for determining, if possible, when the level is exceeded; and by declaring what shall happen legally, if anything, in the event of an exposure above such a level. I feel that this implementation will not be effective in protecting the health of the people of the United States unless the sources regulated, measured, and monitored include

all controllable sources that would contribute significantly to the dose, and unless no more than one regulatory agency is responsible for determining the maximum dose level.

Chairman ANDERSON. May I break in to tell you that the long bell was a vote call and I have to go up to vote. I do not think you will feel that it is a lack of interest. I hope you will comment on section (G), which provides that the Commission shall set up certain standards. I am interested in those and I would like to read your testimony later, if I could not hear it this afternoon.

Mr. FRAMPTON. Thank you very much, Senator.

We have then, impinging on each other, the scientific and medical problem of a call for definitive evidence where none yet exists, and a need for an unprecedented type of control or regulation based on such evidence. Although our society is thus confronted somewhat suddenly with a mixture of different problems that would conventionally fall into separate fields of expertness, but that in this area are all balled tightly into one wad, there is hope, I believe, if the attack on these problems is made in an integrated way.

The NCRP, as a single, informed, body, with a national orientation, would seem an appropriate one to mount the attack; but because it brings forth only State-recommended standards, because it brings no regulatory experience or regulatory responsibility to them, and because it cannot put behind them the weight or compulsion of a regulating agency, its recommendations, while much better than none if the State is determined to fix standards and is going to turn somewhere for a model, seem to me to fall short of what is really needed.

The AEC is a Federal regulatory agency, but its jurisdiction is limited as to the sources of radiation, and its efforts to conform entirely to NCRP standards in order to maintain uniformity are partly foredoomed. The necessity for making a workable regulation within the framework of its limited jurisdiction forces the AEC, with NCRP draft in hand, to alter first a phrase, and then, perhaps, a whole approach, to a particular aspect of the problem, and finally to produce a regulation which in many respects differs from the NCRP suggestions. Partly this comes about because the NCRP draft does not lend itself without some alteration to a workable statement of a legal standard. Partly it comes about because the NCRP was thinking of regulating all sources of radiation within the limited area of one State, while the AEC is thinking of regulating only some sources—its licensees only—within the wider area of the whole country. And partly it comes about because there are some respects in which the NCRP and the AEC do not see entirely eye to eye.

Turning to the States, some have determined occupational standards in terms of roentgens, some in terms of rems of a little different number than the NCRP, some have adhered more or less to NCRP standards, by reference or otherwise, making changes here and there, some have adhered to AEC regulations and some have done nothing. The most recent State to determine standards, Minnesota, provides that the quantitative amounts of the "appropriate limits" fixed in its regulations "are presumed to be the quantitative standards" established by the NCRP. I do not know how a standard can be fixed in terms of a presumption that it is a standard fixed somewhere else.

This summary, however, does bring up a very persuasive argument against my position—an argument more fully developed by Messrs. Robert L. Hamilton and William A. W. Krebs, Jr., in the March 1959 issue of the Vanderbilt Law Review. They admit that uniformity is desirable but they say that it is not necessary and that nonuniformity is not important in view of the slight variation in actual radiation effect among the different standards or legal statements of standards adopted by the different States. They say that the fallacy of the view that even slight variance must be avoided is that it "ascribes greater quantitative significance" to the maximum doses than is warranted and implies "a black-and-white distinction that does not in fact exist." I think they are quite right in emphasizing that it does not exist in fact or in present scientific findings. Their argument, however, ignores the insistence of the law on a fixed line, or black-and-white distinction, when conduct is to be regulated and when definite consequences are to follow from conduct or events sought to be prevented by regulation. Once lines are fixed, white rights and black liabilities will unavoidably hinge on them, whether or not they accurately reflect a scientifically demonstrable condition. In Illinois, for example, a man with 0.15 percent by weight of alcohol in his blood is presumed by statute to be drunk, although in fact he may act and react as though stone sober. Yet certain legal consequences, both civil and criminal, are made to hinge on the precise percent without regard to how masterful his control over himself may be.

I think we cannot now foresee, in terms of liability, compensation, job practices, forced retirement of an overexposed person from a job, required changes in operating methods, equipment and machine design, insurance costs, product acceptance, community reaction, or whatnot, what differences a little variance in legal standards will make, even though we may be pretty sure today that the standards may be low enough so that slight variations will not be medically significant. The consequence of variation is especially unforeseeable when we take into account the warnings of both the NCRP and AEC that its existing suggestions are "subject to change" with the development of knowledge, with possible increase in the average exposure of the whole population, and with further administrative experience. The present maximum permissible accumulated, or genetic, dose, however conservative in relation to acute doses producing clinical symptoms, could change if the amount of radiation from uncontrollable events such as weapons testing or war use, or greatly increased medical uses, take up more than they now do of the reserve of 14 million man-rems per million of population to which the NCRP would limit our total exposure at present.

Leaving aside momentarily the problem of inspection, enforcement of regulations, and detailed control of actual use of the variety of different sources of radiation, all of which could well involve considerable cooperation between the State and Federal Governments, it seems to me that the fixing of legal standards is a novel and a national regulatory public health problem.

For these reasons I oppose that part of the AEC bill that envisions greater control and activity by the States in the formulation of such standards, and I would favor a bill which would recognize the Federal public health nature of the problem, preempt the fixing

of standards to the Federal Government, and assign jurisdiction over it to a single, Federal agency. At the very least my views should raise a doubt whether encouragement to the States to take over from the National Government in this area is not a short-run move in the wrong direction. In view of these doubts it would be better to do nothing than to enact all of the proposed AEC bill. I believe that there is still time to give this matter a longer-range look and adopt a longer-range allocation of Federal and State responsibilities.

Representative HOLIFIELD. Thank you, Professor Frampton, for your very provocative testimony. I could not help but think as you went through your testimony of the difficult problem which this committee faces and has been continually faced with in this new field.

Yet, because we cannot fix definitely the maximum number of permissible doses and many other facets of this which depend on expert testimony, and many times we get divided expert testimony, we nevertheless have an obligation to proceed to the best of our ability to try to do something that will protect the people.

This we have tried to do by having general Federal legislation, such as the 1954 act, which allowed flexibility in the administrative agency, the AEC. Of course, with that administrative flexibility they can adjust themselves to the new information that is given to them by changing the regulations.

I am inclined very much to believe that in setting standards in this field, that function, must remain a Federal obligation.

You are not suggesting, necessarily, that there cannot be widespread implementation by the States of the standards set by the Federal Government, are you?

Mr. FRAMPTON. No, I am not, Mr. Chairman. I would agree with your statement. As I read the proposed AEC bill, however, the proposed bill would permit the States to fix standards. While the general tenor of the bill suggests that the AEC will try to bring the States along to fix uniform standards, it would appear to me under the bill, if Congress were to pass it, that Congress would be recognizing that the State has the authority to fix standards, and has the authority to fix varied standards.

This would be a situation that I think the Congress should undertake to avoid.

Representative DURHAM. Would you apply that to all radiation sources, even in the field of X-rays?

Mr. FRAMPTON. The problem here, Mr. Durham, is, if you are undertaking to protect the health of a person and you fix the level of radiation to which he will be exposed, anything to which he will be exposed from any source will contribute to that level. So that, if the level is not fixed in terms of everything that is going to contribute to it, it seems to me that the level does not mean very much.

Representative DURHAM. On that basis you would include all the manufacture of the weapons materials and everything else?

Mr. FRAMPTON. Let us put it this way: If a Federal agency were setting the standard, it would have to take that into account even though it might not be able, quite obviously, to control it. It would have to take into account, for example, that a foreign government might detonate a weapon which would significantly raise the fallout, and would

it not, therefore, have to consider what the effect of this increased exposure would be on the levels it was fixing for other purposes?

Representative DURHAM. I should think so. Of course, there is very little we could do about that.

Mr. FRAMPTON. The agency could not, but it should take it into account.

Representative DURHAM. Of course, they take it into account now under the present system.

Representative HOLIFIELD. Is it your contention, Professor Frampton, that the present levels of NCRP and the international agency applies only to the radiation from atomic energy and does not take into consideration in the setting of those standards the background radiation and the addition of bomb test radiation?

Mr. FRAMPTON. No, that is not my position, Mr. Chairman. I think the NCRP has undertaken to take this all into account.

Representative HOLIFIELD. That is my understanding.

Mr. FRAMPTON. Yes. They have their standards. I was directing my remarks in my statement to their suggested model regulations.

Representative HOLIFIELD. I can readily see that they must keep themselves in a flexible position. If, for instance, there was a tremendous increase in bomb testing over a period of 5 years, enough to raise the background level much higher than it has been raised, then they might very well issue a new low-level permissible rate and dose as the new standard to go by.

Under your philosophy, this would mean that there would be a regulation issued by the Federal Government and that would be immediately accepted by the States as being the level.

Mr. FRAMPTON. Under my philosophy, it would not make any difference, if I might say so, whether the State accepted it or not. It would be a regulation which would be effective. That is, it would be an effective regulation.

Representative HOLIFIELD. To be effective the States would have to acquiesce to it. If your State had an independence to set standards, and this is the thing you do not want them to have, then they might set their standards high in regard to the overall level set by the AEC or by any other Federal agency.

Mr. FRAMPTON. I had in mind if the State were inspecting and it received notice that the standard had been tightened, that is, the number of permissible rems had been lowered, it would simply instruct its inspectors accordingly, even though someone in the State might say we think this is being very overconservative. But you are to inspect to this standard.

Representative HOLIFIELD. I am not quarreling with you, but what you are saying is that the Federal Government should in this particular field in the setting of standards preempt the field?

Mr. FRAMPTON. Exactly.

Representative HOLIFIELD. And make its standards obligatory upon the States?

Mr. FRAMPTON. Yes, that is my position.

Representative HOLIFIELD. Mr. Ramey?

Mr. RAMEY. Do you think that under strict constitutional interpretation the Federal Government could preempt that field with respect to X-rays and other sources, other than those arising from Fed-

eral ownership or some overriding Federal responsibility and establish such standards?

Mr. FRAMPTON. You ask a very difficult constitutional question, of course, Mr. Ramey, to which I would give this answer: If my view is right that this is not only the best way to do it, but perhaps in view of the unusual nature of the problem the only way to do it, then I think that the Supreme Court will uphold the power of the Federal Government to do it. I think the argument you would have to make to the Supreme Court on the constitutional issue, is that unless the Federal Government preempted the fixing of standards, the regulation of the matter would have been ineffective.

I would predict that if that is so, the Supreme Court would go along with it. I do not think the Supreme Court is going to put the Constitution in the way of the health of the people if this is the only way the health of the people can be protected.

Mr. RAMEY. This has happened before, however. It has taken the Supreme Court a little while to catch up.

Mr. FRAMPTON. Yes.

Mr. RAMEY. Short of this, it would be possible to have a standard that would be uniform, established by a Federal agency but not necessarily legally binding on the States on all aspects. You could have a standard that would be applicable legally on the use of isotopes from Government reactors and so on, but that would be in a sense permissive on other hazards under State jurisdiction; or that you could hand grants of money to the States on condition that they comply with the Federal standard without it being a legally enforcible standard.

Representative HOLIFIELD. Let us explore that a little bit. Is it not true that in the case of narcotics the Federal Government has enforced upon the States for the benefit of the general health and welfare certain Federal regulations and the States are obligated to enforce these regulations?

Mr. RAMEY. That may be tied into interstate commerce.

Mr. FRAMPTON. I was going to ask whether it is or not. Does the Federal Government regulate the sale of marihuana intrastate? Offhand, I don't know.

Representative DURHAM. It just confiscates it; it does not regulate it.

Mr. FRAMPTON. Then it controls it.

Representative DURHAM. Which is right in my opinion.

Representative HOLIFIELD. It is not a question of whether it would be narcotics or not.

Mr. FRAMPTON. If Mr. Durham thinks that is right, then he means that the problem is sufficiently pressing so that he does not think there is a serious constitutional objection to it, and I feel somewhat the same way about this fixing of obligatory standards.

Representative DURHAM. Speaking of the narcotics law, most of the States do have their own narcotics regulations, but the field is more or less preempted to the Federal Government. It goes in and controls and can confiscate or anything else it desires to do where there is a violation of the Federal statute.

Representative HOLIFIELD. The so-called Lindbergh law on kidnaping is another case in point. Kidnaping at one time was considered completely a part of the State police powers, but when they started taking them across State lines, the Federal Government

stepped in and the so-called Lindbergh law was enacted by the Federal Government and it became a Federal law.

Counterfeiting is another place where the Federal Government stepped in. I do not think all of these laws depend upon the interstate commerce clause either.

Mr. FRAMPTON. I might add, though, with regard to Mr. Ramey's suggestion that grants or other means be used to induce uniformity, that this is a point upon which Congress would not necessarily have to make up its mind at this time. It could conceivably leave this to the agency for itself at a later time to reexplore. It might be that this would be a better way to work it out.

Representative HOLIFIELD. Let us direct our attention strictly to this section (G) on page 5 of the bill which reads as follows:

> The Commission is authorized and directed to cooperate with the States in the formulation of standards for the protection against hazards of radiation, to assure the State and Commission programs of protection against radiation will, to the extent feasible, be coordinated and compatible.

If the Congress directs them to cooperate that is a little bit different from the thing you say; cooperate might mean almost anything.

Mr. FRAMPTON. Yes.

Representative HOLIFIELD. It might mean complete surrender of the Federal Government to a position of the State.

Mr. FRAMPTON. Yes.

Representative HOLIFIELD. But if the Federal Government through its legislative body authorizes and directs the Atomic Energy Commission to formulate standards which shall obtain in every State in the Union and be observed in every State, that is a little bit different proposition.

Mr. FRAMPTON. Yes. I think a part of this (G) is now in the act. I am not quite certain how much of this language comes out of the present act.

Mr. TOLL. There is a similar provision in section 161 of the act under the general authority of the Commission.

Representative HOLIFIELD. The word "cooperate" is a vague and ambiguous term in my opinion.

Mr. FRAMPTON. Yes, it is.

Representative HOLIFIELD. It does not imply the giving of authority to either side.

Mr. FRAMPTON. That is true.

Representative HOLIFIELD. This is one of the things I understand in your statement that you are concerned with?

Mr. FRAMPTON. Yes, I am. This is one of the sections I would not like to see enacted.

Representative HOLIFIELD. Yes, because it is ambiguous. The word "cooperate" is a nice friendly word but legally it does not carry with it the authority that a clear direction by the Congress would carry.

Mr. FRAMPTON. Yes. It appears to say in effect, to the AEC, you fellows get together with the States and work something out——

Representative HOLIFIELD. Do the best you can.

Mr. FRAMPTON. Yes. It authorizes them to reach agreement. The AEC, of course, may have intended from this draft to mean that

the purpose of the cooperation would be to get coordinated regulations, but the legislation does not make certain that that will be the result.

Mr. TOLL. Could I point out, Professor Frampton, that there is in clause 2 of subsection (d) beginning at the bottom of page 4, a requirement that before the Commission turns over to the States any of these responsibilities, the Commission must make a finding that the State program is compatible with the Commission's program on the control of radiation hazards.

Mr. FRAMPTON. I wonder what that means?

Mr. TOLL. That perhaps could be spelled out, that the State program has to be identical or the State standards have to be identical to the Federal.

Mr. FRAMPTON. I see a host of problems under this clause both political and otherwise. Supposing the Commission worked out an agreement with State A and then State B comes forward and says we are ready, but we do not think the AEC standards are sufficiently strict, so we are going to be compatible with you in every respect except that we are going to make the standards a little stricter.

May the AEC then say you are not compatible with us and we won't give you an agreement? We are going to make you follow our standards and not your own? Then may the States say that the Commisison is violating the statute because this is virtually a directive to them to cooperate and to reach an agreemnet if the standards are compatible and stricter standards are not incompatible? Could the State say that?

Mr. TOLL. I wouldn't think it was a directive. This contemplates an agreement to be entered into between the Commission and a Governor, and this is one of the findings that has to be made before the Commission can enter into such an agreement.

Mr. FRAMPTON. The statute says that the Commission shall, not may, enter into an agreement if it finds that the program is not incompatible.

If this is the basis for its finding, that is, that the State standard is stricter, may the State say that is not incompatibiliy and you have to let us regulate by stricter standards if we want to? Can the State say Congress did not intend that you could require us to conform in every detailed respect to your standards? Couldn't they make this argument?

Representative DURHAM. How can you avoid that?

Mr. FRAMPTON. How can you avoid this sort of a situation?

Representative DURHAM. That is right. You have a split jurisdictional problem under present conditions. I am talking about just as it exists today. I do not see how we can, with any safety, turn over everything that AEC is producing today and say to the States, you regulate this.

What you are advocating, as I understand, in the end result is complete State control.

Mr. FRAMPTON. Not quite, Mr. Durham.

Representative DURHAM. No, that is wrong. I mean complete Federal control.

Mr. FRAMPTON. Not quite, Mr. Durham, because what I am advocating is complete Federal single determination of the standards or levels.

Representative HOLIFIELD. But you do not carry that into the field of law enforcement or implementation. You leave that to the States.

Mr. FRAMPTON. That's right. Working back from this level, all the implementing, the enforcement, the inspection and other types of regulation it seems to me, could, as I say, in my statement, very well be a fruitful area of cooperation.

But at the beginning it seems to me one national agency must be responsible for deciding this very difficult combined scientific and legal question of what is the level or what are the different levels for different circumstances, for different types of people and so forth.

Representative DURHAM. That is more or less of a question for the scientists to determine.

Mr. FRAMPTON. It is partly so and partly not because scientists cannot determine it now, but everybody wants a level to be fixed. So the scientists say, we can't do it but if you make us we will pick a point.

I say who is picking this point? Is it scientists picking it as a scientific matter? The answer is partly yes and partly no. He is picking it partly because he has scientific evidence that the point he picks, as far as he knows now, probably is a point at which everyone will be safe.

Representative DURHAM. Do you not think he is the best qualified to date to do that?

Mr. FRAMPTON. Let us suppose, for example, that the scientists has evidence today that a level of 30 rems—I am just picking an arbitrary level out of the air—is a level at which he knows there will be observable injury. But he does not know quite how much less than that.

He doesn't have the evidence. People are working on it. So he says, all right, you want a level. So I have to pick something out. I don't want to be criticized later for not having picked out a low enough one so I will pick out, let us say, five rems.

When he picks five, I ask this question: Is that a scientific determination? And it seems to me the answer is partly, it is, but partly it is not. He might have said four or he might have said six.

Representative HOLIFIELD. Is this important for the objective which we seek, which is the protection of the people, whether it is four or five or six? Is it not true that the lowering of the standards from 100 to five has been done on the basis, you might say, of collective prudent judgment rather than on observable laboratory results from exposure of this level of radiation to any type of organism, animal or man?

Do you understand my question?

Mr. FRAMPTON. Yes, I think your statement is a very good statement of what has been done. I think it is a collective judgment.

Representative HOLIFIELD. You have no objection to us doing that in view of the fact that we cannot determine accurately at this time whether it should be 100 rem or 5 rem over a lifetime? You have no real objection to us doing the best we can on this, realizing that this field is a new field and that the time may come when we have additional information where we could raise that back up to 30 or we could lower it to zero.

Therefore, if this line of reasoning be true, it seems to me that it supports your position that the setting of standards should be tightly controlled in a centralized Federal body so that you would have the

control centrally located so it could be enforced wherever it might be necessary in the Nation and it also might be in a position to make it flexible in order to change it with the changing scientific knowledge.

Mr. FRAMPTON. Yes, sir.

Representative HOLIFIELD. From a practical standpoint are we not forced to go ahead under these rules?

Mr. FRAMPTON. It seems to be so.

Representative HOLIFIELD. You are not really objecting to doing this?

Mr. FRAMPTON. No.

Representative HOLIFIELD. But you do point out that we are legislating to a certain extent, in the dark?

Mr. FRAMPTON. Yes.

Representative HOLIFIELD. But we are extrapolating, you might say, down from a known level of danger to a probable or a suspected level of what might be dangerous. That is really what we are doing, is it not?

Mr. FRAMPTON. Yes.

Representative DURHAM. It is very evident, of course, Professor, that you have given this a good deal of thought as is evidenced from the statement before the committee. On the point that Mr. Holified has just raised, do you feel we are premature in adopting legislative proposals at the present time or that we should proceed as we have been proceeding?

Mr. FRAMPTON. I feel it would be premature. Premature is not the word. I feel it would be unwise for you to recommend to the Congress the legislative proposal which the AEC has made to you.

Representative HOLIFIELD. This is a different question. This is not the question that Mr. Durham asked.

Mr. FRAMPTON. Then I did not understand his question, Mr. Chairman.

Representative DURHAM. We have been struggling with this for some years. It is nothing new with us. I started in this in the early days of the old Chicago Stadium and it has been with me ever since.

We are worried about what we can do, what we might do, and what we should do. Sometimes I think we have been probably a little bit ahead in adopting some legislative proposals, although I wanted to get this out of the socialized structure and get it into the field of humanities in the 1954 act.

The 1954 act, of course, began releasing this more or less, freely to the country. It has been handled very carefully and very safely as far as AEC is concerned. There is nothing much we can do about Russia and how much fission material they put into the air, but there is probably some way we can control our own efforts.

Today we are faced again with whether or not we should adopt some law or whether or not we should continue as we are continuing today, the best we can. The pressure has been pretty severe on us to do something about this. That is what we are struggling with here.

Representative HOLIFIELD. I think you have made a strong case for centralized control for setting up standards.

Mr. FRAMPTON. That is what I would like to see done now.

Representative HOLIFIELD. I want to look your statement over carefully and the other articles that you have furnished, Professor.

Mr. FRAMPTON. Thank you.
(The statement referred to is as follows:)

STATEMENT OF GEORGE T. FRAMPTON

My name is George T. Frampton. I am a member of the bar of New York and Illinois and a professor of law at the University of Illinois College of Law, which was one of the first law schools to sponsor a seminar in the problems of atomic energy law in its regular curriculum. I am a consultant member of the Illinois Atomic Power Investigating Commission, a member of the Advisory Group of Subcommittee 10 of the National Committee on Radiation Protection and Measurements (NCRP), and a member of the informal panel which advised on these hearings of your committee. I do not represent any person, firm or client who has any interest in any matter under consideration by this committee and my views, therefore, are at least disinterested.

At the core of Federal-State complexities in radiation control is one problem that is detachable for examination. That is the problem of determining maximum permissible exposure levels of ionizing radiation as a matter of law, and this statement is confined to that problem.

We all know that the scientific and medical knowledge which must forerun such determinations is fragmentary, based largely on observations of lower organisms, and highly tentative, even as to the relatively immediate effects of radiation. Elsewhere I have contended that this state of our scientific knowledge, and the need for more of it, the further objective of minimizing genetic harm, the cumulative impact of radiation from a variety of different sources, the possibilities of interstate contamination, the difficulties of effective monitoring and recordkeeping, the mobility of the population, and the future need for international uniformity of regulation, all point to a present need for a single, national determination of maximum legal levels or standards. My arguments along those lines are more fully quoted at pages 314–317 of the Joint Committee print containing selected materials for this hearing. Accordingly, I believe that so much of the bill proposed in March 1959, by the Atomic Energy Commission as would hand over to some States, by agreement or cession, authority to determine such standards, is unwise and should not be enacted, and I would like to comment, in support of my position, on the present efforts of the NCRP, the AEC, and the States.

The NCRP has performed a great task in standardizing measurement terminology, pooling expert evidence, judgment, and opinions from diverse fields, and undertaking to reach a consensus on the known physical and medical effects of ionizing radiation. To give some usefulness to its work, however, its hand has been almost forced to lay down fixed standards, and from there it has been led almost unwillingly to propose legal standards in the form of suggested model radiation regulations for the States. These regulations have been swallowed down, sometimes whole, by several States, partly from their hunger for authoritative direction and uniformity.

I do not criticize the NCRP work, in which I have participated in a very small way, nor any of the highly qualified men who make up its committees and staff, but I do believe that in backing itself into the drafting of model regulations, it has backed itself into a briar patch. The NCRP is composed of specialists eminently qualified for technical, scientific, and medical standardmaking. In that area, because of the newness and meagerness of scientific and medical evidence, they are buffeted by even more than the usual difficulties of formulating national and international agreement on terminology and measurement. Translating the findings they can assemble into definite conclusions that could guide voluntary safety measures is difficult enough. It involves, in some instances, picking a point which could later be shown to have been too low or too high on a continuous spectrum. Embodying such points into recommended legal rules and formulating sanctions to enforce them is quite another matter. While it is imperative that anyone attacking the legal aspects of this problem have a sensitivity to the implications and limitations of the scientific findings, a corollary is also true. Anyone who recommends legal standards of conduct, even though they arise out of and bear the most intimate relationship to scientific knowledge, should be aware of the implications and limitations of government regulation generally, and I fear that most of the men in NCRP are not by either training or interest inclined to draft rules or grapple with the problems that such drafting entails. Their work is indispensable undergirding for law, but

I doubt whether it should constitute a model for the law itself in any field.

Moreover, as with the scientific and medical approaches, the legal approach to regulation in the field of ionizing radiation presents unusual, if not unique, legal problems beyond those usually encountered in ordinary government regulation. Here the initial objective is the difficult one of defining as a matter of law a level of unseen and unfelt radiation above which no person shall be exposed, from any source, internally or externally, occupationally or otherwise, suddenly or slowly, in one accident or over a lifetime, as an individual sufferer, or as a gene bearer in the total population. If a true scientist were to say that such a level cannot be selected consistently with present scientific knowledge, the lawmaker must nevertheless select an arbitrary point or abandon his lawmaking. If a scientist were to say that such a point is probably too low, the lawmaker must have a reason for being overconservative. If the point is probably or even possibly too high, the lawmaker must calculate the degree of the risk of possible loss against the benefit presumably to be derived from legal permission to operate at the riskier standard. The determinations which involve this weighing, this balancing, and this calculation of conflicts, risks, and interests are neither scientific nor strictly legal; they are novel public policy questions to be determined, in our society, in the last analysis, by someone or some group having continuing access to current scientific developments, but who is ultimately responsible to the people.

From the point selected as the maximum dose for the individual, the drafter must then work back to implement the level selected by regulating the source of the radiation, where feasible; by setting up means for determining, if possible, when the level is exceeded; and by declaring what shall happen legally, if anything, in the event of an exposure above such a level. I feel that this implementation will not be effective in protecting the health of the people of the United States unless the sources regulated, measured, and monitored include all controllable sources that would contribute significantly to the dose, and unless no more than one regulatory agency is responsible for determining the maximum dose level.

We have then, impinging on each other, the scientific and medical problem of a call for definitive evidence where none yet exists, and a need for an unprecedented type of control or regulation based on such evidence. Although our society is thus confronted somewhat suddenly with a mixture of different problems that would conventionally fall into separate fields of expertness, but that in this area are all balled tightly into one wad, there is hope, I believe, if the attack on these problems is made in an integrated way.

The NCRP, as a single informed body, with a national orientation, would seem an appropriate one to mount the attack; but because it brings forth only State-recommended standards, because it brings no regulatory experience or regulatory responsibility to them, and because it cannot put behind them the weight or compulsion of a regulating agency, its recommendations, while much better than none if the State is determined to fix standards and is going to turn somewhere for a model, seem to me to fall short of what is really needed.

The AEC is a Federal regulatory agency, but its jurisdiction is limited as to the sources of radiation, and its efforts to conform entirely to NCRP standards in order to maintain uniformity are partly foredoomed. The necessity for making a workable regulation within the framework of its limited jurisdiction forces the AEC, with NCRP draft in hand, to alter first a phrase, and then, perhaps, a whole approach, to a particular aspect of the problem, and finally to produce a regulation which in many respects differs from the NCRP suggestions. Partly this comes about because the NCRP draft does not lend itself without some alteration to a workable statement of a legal standard. Partly it comes about because the NCRP was thinking of regulating all sources of radiation within the limited area of one State, while the AEC is thinking of regulating only some sources—its licensees only—within the wider area of the whole country. And partly it comes about because there are some respects in which the NCRP and the AEC do not see entirely eye to eye.

Turning to the States, some have determined occupational standards in terms of roentgens, some in terms of rems of a little different number than the NCRP, some have adhered more or less to NCRP standards, by reference or otherwise, making changes here and there, some have adhered to AEC regulations, and some have done nothing. The most recent State to determine standards, Minnesota, provides that the quantitative amounts of the "appropriate limits" fixed in its regulations "are presumed to be the quantitative standards" established by the

NCRP. I do not know how a standard can be fixed in terms of a presumption that it is a standard fixed somewhere else.

This summary, however, does bring up a very persuasive argument against my position—an argument more fully developed by Messrs. Robert L. Hamilton and William A. W. Krebs, Jr., in the March 1959 issue of the Vanderbilt Law Review. They admit that uniformity is desirable but they say that it is not necessary and that nonuniformity is not important in view of the slight variation in actual radiation effect among the different standards or legal statements of standards adopted by the different States. They say that the fallacy of the view that even slight variance must be avoided is that it "ascribes greater quantitative significance" to the maximum doses than is warranted and implies "a black-and-white distinction that does not in fact exist." I think they are quite right in emphasizing that it does not exist in fact or in present scientific findings. Their argument, however, ignores the insistence of the law on a fixed line, or black-and-white distinction, when conduct is to be regulated and when definite consequences are to follow from conduct or events sought to be prevented by regulation. Once lines are fixed, white rights and black liabilities will unavoidably hinge on them, whether or not they accurately reflect a scientifically demonstrable condition. In Illinois, for example, a man with 0.15 percent by weight of alcohol in his blood is presumed by statute to be drunk, although in fact he may act and react as though stone sober. Yet certain legal consequences, both civil and criminal, are made to hinge on the precise percent without regard to how masterful his control over himself may be.

I think we cannot now foresee, in terms of liability, compensation, job practices, forced retirement of an overexposed person from a job, required changes in operating methods, equipment and machine design, insurance costs, product acceptance, community reaction, or whatnot, what differences a little variance in legal standards will make, even though we may be pretty sure today that the standards may be low enough so that slight variations will not be medically significant. The consequence of variation is especially unforeseeable when we take into account the warnings of both the NCRP and AEC that its existing suggestions are "subject to change" with the development of knowledge, with possible increase in the average exposure of the whole population, and with further administrative experience. The present maximum permissible accumulated, or genetic, dose, however conservative in relation to acute doses producing clinical symptons, could change if the amount of radiation from uncontrollable events such as weapons testing or war use, or greatly increased medical uses, take up more than they now do of the reserve of 14 million man-rems per million of population to which the NCRP would limit our total exposure at present.

Leaving aside momentarily the problem of inspection, enforcement of regulations, and detailed control of actual use of the variety of different sources of radiation, all of which could well involve considerable cooperation between the State and Federal Governments, it seems to me that the fixing of legal standards is a novel and a national regulatory public health problem.

For these reasons I oppose that part of the AEC bill that envisions greater control and activity by the States in the formulation of such standards, and I would favor a bill which would recognize the Federal public health nature of the problem, preempt the fixing of standards to the Federal Government, and assign jurisdiction over it to a single Federal agency. At the very least my views should raise a doubt whether encouragement to the States to take over from the National Government in this area is not a short-run move in the wrong direction. In view of these doubts it would be better to do nothing than to enact all of the proposed AEC bill. I believe that there is still time to give this matter a longer range look and adopt a longer range allocation of Federal and State responsibilities.

Representative HOLIFIELD. Thank you very much.

Next, we have the representative of the State and Territorial health officers.

STATEMENT OF DR. ROY L. CLEERE, EXECUTIVE DIRECTOR, COLORADO DEPARTMENT OF PUBLIC HEALTH

Dr. CLEERE. Thank you, Mr. Chairman.

I am Dr. Roy L. Cleere, and I am executive director of the Colorado Department of Public Health. Today, however, I am appearing here

as a representative of the Association of State and Territorial Health Officers, as a member of its Radiological Health Committee, at the request of our president, Dr. D. G. Gill, the health officer of Alabama. I am also a member of the Advisory Committee of State Officials to the Atomic Energy Commission.

As full-time public health officials with an intimate involvement in any Federal-State public health program, either in actual existence or further contemplated, our association is obliged to take a strong interest in the questions you have under study at this time. Unfortunately, the mechanism is such that owing to the short notice we received, it was not possible to give this matter the thorough study which I believe it deserves. However, most of the States have been involved in one way or another with the public health aspects of atomic energy, and we have attended numerous meetings and conferences involving Federal officials including the Atomic Energy Commission and others having an involvement in this field. Therefore, I do not come entirely unprepared to discuss this subject, since, in addition to having the benefit of such experiences, I have also had the opportunity in recent weeks to confer with other officers of the association concerning the subject at hand. One of these occasions was the recent Public Health Service-Association of State and Territorial Health Officers conference in Denver, Colo., on April 13–14, which also included the participation of the Atomic Energy Commission.

In the Joint Committee print which you have prepared, entitled "Selected Materials on Federal-State Cooperation in the Atomic Energy Field," published by the Congress in March 1959, there is contained in the foreword the following statement:

> **The Joint Committee on Atomic Energy has scheduled public hearings tentatively set from May 12–May 15, 1959, to consider proposed amendments to the Atomic Energy Act of 1954 with respect to Federal-State cooperation.**

As one reads further in the document, he finds the statement that—

> **The Atomic Energy Act of 1954 provides a comprehensive framework for development and regulation of atomic energy uses by the Federal Government, but is silent as to corresponding responsibilities and regulatory powers of State and Federal Governments.**

It says further that there exists some doubt as to whether Congress had preempted the field in certain areas of Federal regulation, and that it is the desire of many persons that the Congress delineate more clearly the respective areas of the responsibility of the Federal Government on the one hand, and the State and local governments on the other. A series of questions are then proposed as to how this might be done, and further, how assistance might be given the States in order to increase capacities of States to assume more responsibility in the field and also what the scope of such control might be. Because of time limits, I cannot discuss the many other details presented in that excellent volume, and will only add that all of the State health officers received copies of it shortly after its publication. They have indicated considerable appreciation of its contents, and have individually given considerable thought to much of it. Therefore, we believe a constructive step has already been taken through this form of enlightenment of public health officials, who I assume are being called upon to extend their efforts in the control area of this most important activity. Consequently, my remarks will attempt to cover in a necessarily brief

manner some of the principal items which are the concern of this committee, as evident in the aforementioned publication and in the agenda of this particular series of hearings.

THE LEGAL RESPONSIBILITIES OF STATE HEALTH DEPARTMENTS

In discussing this aspect of the matter, the pertinent question is, What conclusions can be drawn from our experience regarding respective roles of the Federal agencies and the State health departments in radiological health fields?

It has now become clear that maximum progress in the development of our present control program depends upon legal clarification of Federal and State responsibilities and how support will be afforded the various activities when this clarification has been reached. With the great expansion in this field, and with the peak of activities in it still to come, we can no longer delay answering the questions which your committee has already propounded. As if in response to this desire of your committee, we have in recent months been the beneficiary of two important reports from distinguished consultant groups to the Federal Government. The first to make its report was the National Advisory Committee to the Surgeon General of the U.S. Public Health Service, in March 1959. The second special report which contained pertinent and well-thought-out advice on the matter was contained in the report of the General Advisory Committee of the U.S. Atomic Energy Commission, addressed to Chairman John A. McCone on May 4, 1959. I have secured a copy of the first-named report, Mr. Chairman, and I am assuming that your committee is already familiar with it. I am prepared to discuss its recommendations in detail, if you wish. If there is not time for that detailed discussion, I do wish to quote at least one section of the recommendations, namely, that at the bottom of page 17:

> The enforcement of regulations affecting the health and well-being of our society has traditionally been the responsibility of State and local governmental agencies. There appears to be no fundamental reasons why such agencies should not bear a substantial responsibility for the regulation of the health hazards associated with radiation exposure.
>
> The Committee therefore recommends that as much regulatory responsibility as possible be vested within State and local governments in the fields of radiation protection. However, in order that the agency may be assured of discharging its responsibilities to the Nation as a whole, the Committee recommends that the agency be granted supervening authority in those areas of enforcement where Federal regulation seems more appropriate. It also recommends that this authority apply under those circumstances where a State or local government finds itself unable to meet its obligations.
>
> Finally, in order that State and local governments may discharge their responsibilities with the greatest effectiveness, the Committee recommends that the agency be granted authority to provide technical and financial assistance to such governments, as in other public health programs.

Turning now to the second series of recommendations contained in the excellent statement of the General Advisory Committee to the Atomic Energy Commission, which I am sure this particular committee has in its possession, I would like to quote recommendation No. 7 which has particular relevance to the matter at hand:

> (7) Next, the Committee addresses itself to the question of the responsibilities of the Atomic Energy Commission with regard to radiation safety. Clearly, the Commission must assure itself that it is conducting its own operations in a safe

manner, as is required by the Atomic Energy Act. To meet these needs the Atomic Energy Commission has established, in addition to worldwide sampling of air, soil, foods, and water, an effective and outstanding biological and medical research program in the general field of radiation hazards and protection. The AEC needs this program in order to have scientific facts available to insure and improve the safety of its own operations. Therefore, the Committee recommends that the AEC continue its scientific studies in these areas.

As the civilian use of X-rays, radioisotopes, and nuclear reactors increases, public health authorities should actively sponsor proper public standards of radiation safety. In so doing, they should continue to make use of all information available. The relation between the public health authorities and the AEC in its civilian activities should be analogous to that between the same authorities and most industry. The Public Health Service and the Food and Drug Administration should make the best use of information developed by the AEC and others and should be given whatever funds are necessary for programs to be carried out on their own initiative, whether these programs be in the realm of research, training, or dissemination of information to local authorities. It will take time for the public health authorities to develop such programs and to acquire the necessary backgrounds of knowledge and experience. In the opinion of the Committee, the public health agencies, both national and local, should gradually assume responsibilities for matters pertaining to the regulation of all radiation hazards affecting the public. At present X-rays are the most important artificial source of such hazards.

In addition to these recommendations, our association also understands that the Office of the President of the United States also has under study the further clarification and delineation of the roles of the several Federal agencies engaged in various aspects of this field. While I would interpret this to mean that it refers specifically to Federal agencies rather than the States themselves, nevertheless, we take a considerable interest in the ultimate decisions because any rearrangement effected thereby will naturally affect our relationship with the Federal agencies. We in the States work very intimately with the Public Health Service over the whole broad field in any public health program. Therefore, it would seem to us that the Congress is beginning to receive a considerable body of information from experts so that it can attack in a serious way the legislative questions which it is considering in these hearings.

Now I note in the Joint Committee print, which I previously mentioned, an amendment to the Atomic Energy Act of 1954, submitted by the Atomic Energy Commission, with the proposal that this be enacted into law. I understand that it has been introduced in both the Senate and House, with some modifications in the text of that which is printed in this document. We have not had the opportunity to study in detail these bills as finally introduced and, hence, will not attempt to discuss the language of the proposal. I will only attempt to interpret the principles contained in them and attempt to ascertain how the enactment of them might affect existing Federal-State cooperation in the public health field.

First of all, we are glad to see that a concrete proposal is being made to transfer certain Federal responsibilities to the jurisdiction of the States. As we see this particular proposal, however, although it can be considered a forward step, it does not meet the requirements of the presently existing situation. In the first place, if we interpret this proposed amendment correctly, it would provide for the transfer of only a very small fraction of activities presently engaged in under the authority of the Atomic Energy Act of 1954, to wit: Some additional supervision for radioisotopes. As we all know this is a relatively small fraction of the potential exposure problem. Furthermore,

we would assume that the Atomic Energy Commission which is responsible at this time for the issuance of licenses under certain conditions would continue that essential part of the activity.

State regulation and control presumably would only come into operation after such radioisotopes now in possession of Commission facilities go to the licensee. As far as I know, and I, of course, only speak from my own personal experience, there is limited activity at the present time on the part of the Federal Government in supervising the use of these radioisotopes once the licensee receives them, since many of them are short-lived ones designed for medical purposes and hence apparently not considered to require extensive supervision. There may be exceptions, of course, especially in industry. At any rate, it would appear to me as a health officer, that the phase of activity being transferred amounts to very little of any on-going programs of the Atomic Energy Commission.

Therefore, since this appears to be true, and in view of the excellent studies and proposals of the advisory groups referred to, we feel that action might be delayed on amending the act until the Congress is ready to give consideration to the problem in the form of a more comprehensive amendment which takes into account the management of the various questions that both you and we consider necessary to answer. For example, if the Congress believes, as we do, that primary responsibility for the health of its citizens resides within the several States, this should be recognized even to the point, if that is necessary, of reaffirming this principle in the legislation.

As the matter now stands, there is the strong implication, if not the actual interpretation, that the Atomic Energy Act preempts the whole field to the Federal Government. The practical effect of this, insofar as development of a comprehensive radiological health program is concerned, is to retard such a program in the radiation field where there are numerous and growing problems.

Senator ANDERSON. I understand that paragraph to mean that you think we should put off any final action on the bill at the present time until we have a chance to work out a more comprehensive amendment.

Dr. CLEERE. That would be my feeling, Senator Anderson. I think we should be sure where we are going with reference to the allocation of responsibilities.

Representative HOLIFIELD. Of course, that is why the amendment does not go any further than it goes, because we are quite sure we cannot go very much further.

The States themselves have said that they do not have the capacity to handle the job as yet. They do not have the trained personnel or the knowledge to do the whole thing. What you are in effect advocating, as I understand it, is that it is better not to do anything until we can do everything.

Dr. CLEERE. No, sir, Mr. Holifield. I do know that many States are developing radiological health services.

Representative HOLIFIELD. Yes, a few of them are, but even those few that have gone into this field have not developed, in my opinion, a competence that is necessary to really handle all of the job. We are still depending upon the appropriations from the Federal Government and the AEC personnel. Some of it is being done by the

Public Health Service but a very small part. Over the years the Public Health Service has not even moved into the field of X-ray radiation and other types which have been very damaging according to present thinking, to people.

There has been testimony before this committee asking us to transfer this bodily to Public Health. Some of us feel while this might theoretically be the proper thing to do, that they are not equipped to handle the job, and neither are the States.

Dr. CLEERE. I think that we have reached the stage where serious consideration should be given to delegating responsibility to the Public Health Service at the Federal level for radiological health and in turn, the Public Health Service will be in a stronger position to assist the States in going forward with good, well-organized radiological health programs.

Representative DURHAM. They have always had that authority. They could have moved into it many years ago when we first adopted the Public Health Act.

Dr. CLEERE. Mr. Durham, that is true. I think there have been some false impressions. There is a feeling that the Atomic Energy had preempted the field, and it was the sole responsibility of the Atomic Energy Commission.

Representative HOLIFIELD. In the field of the Atomic Energy Commission activities, they have not preempted the field of shoe X-ray machines and fluoroscopes and body X-ray machines and those fields, radium painting of watches and that sort of thing. The Federal Government has not moved into that field.

Dr. CLEERE. I am glad you are saying that because there certainly is an impression that Federal authority prevails.

Representative HOLIFIELD. I am saying what I believe to be a matter of fact. There is a precedent for established authority in these fields in the different States. It would be very difficult to take that away from the States now and give it to the Public Health Service from a practical standpoint.

Dr. CLEERE. The framework is all there, Mr. Holifield, from the viewpoint of the relations with the Public Health Service and the State health agencies.

Senator ANDERSON. He says he is speaking for the Association of State and Territorial Health Officers. I wanted to be sure that it was their testimony that we should do nothing in the field until we are ready to do a final job. I was not certain that was the impression he wanted to leave, but it did seem to me the impression you did leave.

Dr. CLEERE. We feel you would be making a mistake if you adopted this amendment to the 1954 act at this time.

Representative HOLIFIELD. That is what I was trying to get.

Dr. CLEERE. Yes, sir. We are not satisfied with the provisions of the amendment.

Senator ANDERSON. You were not satisfied with the 1946 act, either, at the time it was passed, but it was a pretty good stopgap until we got to the 1954 act. The rumor may have reached you that I was not completely happy with the 1954 act. There was something in there about Dixon-Yates to which I took mild objection and yet it was passed. But I would not say the 1954 act did not make some headway.

I am just wondering if this bill might not take us to a point where we can begin to delineate what our thoughts are. I raise the question now because a long, long time ago, in 1919, I tried to help in the establishment of a State department of health in the State of New Mexico, your neighboring State, and was director of its division of tuberculosis and helped bring Dr. Waller out there to set up a State department of health. Our first State health act was not too good. It was the best we could do. We had to compromise with many different interests. Some people did not want a bill at all. Some did not want a provision that you had to put drops in children's eyes. We got a bill through. I had sort of hoped we might pass some bill here that would not be perfect but might lead toward something in the future. That is the only reason I asked the question. I am not trying to quarrel with you. I wanted to be sure it was the attitude of the State and Territorial health officers that we better leave it alone for the present.

Representative HOLIFIELD. I would like to firm what the chairman said. I would like to say that I am not completely satisfied with this bill, either. I have no doubt in my mind at all but that this bill will be slightly changed before it is finally presented to the Congress. I think the AEC is aware of the fact that sometimes we change the draft of legislation they send up. They would not be too surprised. That is why we have you fellows in here telling us what to do.

Representative DURHAM. Yes. Radiation is not something new.

Dr. CLEERE. No, sir.

Representative DURHAM. The AEC only took hold when we got into the development of the bombs. We have had radiation since 1892.

Dr. CLEERE. I did not mean to imply that progress has not been made. I also realize it is most difficult, as Senator Anderson mentioned, to accomplish all the objectives at any one time in any one bill. But we do not feel that the amendment accomplishes some of the immediate objectives that we desire.

Senator ANDERSON. I am sorry I precipitated such a long discussion, but if you read the early history of the State department of health in our State you will see that we had a very difficult time. We had to go into court round after round. We had a district judge that threatened to beat up the health officer, and so forth. We had a most interesting and amusing experience.

I am very sympathetic generally to the Association of State and Territorial Health Officers and ordinarily quite respectful of their recommendations. That is why I wanted to be real sure what this recommendation was. I am sorry, Mr. Chairman, that I precipitated a long-winded discussion.

Dr. CLEERE. If I may clarify just one other point.

We do not wish to imply that we should stand still, so to speak, with respect to legislation. We think that additional thought and study should be given to this type of legislation. We think we have reached the stage where some of the divisions of responsibility between the two principal Federal agencies in the radiological health field should be more clearly delineated.

Representative DURHAM. We do not even have authority today to put fluoride in drinking water in some places, and that is quite a controversial issue throughout the country.

Dr. CLEERE. That is right.

Representative HOLIFIELD. You may proceed.

Dr. CLEERE. A further point, which is constantly referred to, concerns responsibility for public health and safety in terms of capabilities to manage the problems in this field. While it is true that radiological health programs in the States now have a good way to go in reaching the point of development we deem necessary to control the situation, it is frequently inferred, if not outright said, that States have little or no capability in this regard. We don't know that this is a fact. Consequently, if this committee is to act wisely, it must know the answer to the question that if health agencies do not have the capabilities to manage problems in the public health and safety aspects of the radiation field at this time, where do such capabilities now reside, and in what degree.

RELATIONSHIPS OF STATE AND LOCAL HEALTH AGENCIES WITH THE FEDERAL HEALTH AGENCIES

There are some reasons based upon long experience in other fields of health protection that account for our preference to deal primarily and directly with the Public Health Service in the control of radiation hazards. There are legal reasons for this preference and administrative ones also. We already have the fiscal, administrative and medical framework for efficient and economical Federal-State relationships in public health activities in the areas of general health, tuberculosis, heart disease, cancer, mental health, venereal disease and hospital construction. In the vital areas of air, water, food and milk pollution, patterns are already established for control of pollutants, including those spawned by atomic fission and fusion. What is needed now, and urgently, is to extend the activities of the State and local health departments into the area of radiation hazards in the same ways that extension was accomplished in the past to control infectious diseases and to improve environmental sanitation. Legislative patterns exist for this.

Now with regard to Federal agencies as a resource for strengthening State sources, State health departments have benefited in many ways from services by the numerous Federal agencies concerned with radiological health in the States during the past 10 years. Among these, the two principal ones to be considered are the Public Health Service and the Atomic Energy Commission, insofar as public health radiation problems are concerned. The Public Health Service has continuously provided the State health departments with consultation, and some joint participation in several States in the Department's radiological health studies and programs.

I am confident that State health departments, working with the Public Health Service, can work out a statewide inspection system that minimizes duplication, even though sometimes that takes the form of a "double check" for safety purposes. This double check is often necessary when we consider the dangerous potential of the material we are dealing with, especially when it is considered that no one has all the answers concerning some special aspects. The Public Health Service and the State health departments have worked well together in the past in the establishment of nationwide standards and inspection systems in many other fields of public health endeavor. There is no reason whatever to suggest that radiation protection is an exception.

To give an example of the increasing scope of activities in my own State of Colorado, a new building for the State health department now under construction on the University of Colorado Medical Center campus, will be equipped with a whole-body radioactivity counter, provided by the Atomic Energy Commission. It will be housed in the building's laboratory wing, for which Hill-Burton financial assistance was obtained through the Public Health Service. The whole-body counter, the first of this nature in a State health department, will be installed, operated and maintained by the State health department with funds from the Atomic Energy Commission, probably accompanied by continuous program types of assistance financed by our State and the Public Health Service. It will be made available by the Department to other organizations and individuals needing to use such a facility.

To summarize the main points of our position in bringing the statement to a close, I would like to emphasize the following points:

Although the keynote in Federal-State relations has been one of friendly cooperation, nevertheless, the dispersion of radiological health responsibilities among a list of Federal and State agencies, it seems to us, impedes effective control programs. This makes it difficult to integrate with other health and safety measures that also pertain to the industries and communities affected by radiological hazards.

Therefore, the ASTHO feels that the appropriate Federal and State roles for the future can be stated in the following terms:

1. Fragmentation of radiological health responsibilities is undesirable at both the Federal and State levels of government.

2. The agency responsible for coordinating and administering radiological health services at the Federal level should be the Public Health Service because, by law and tradition, it is the Federal agency responsible for technically and financially assisting the States in developing and extending health services of all types. Last year the Service established a Division of Radiological Health. The Division has begun to expand its staff, research activities, radioactivity surveillance and training programs, and assignment of personnel to State health departments. Among the recommendations of the Association of State and Territorial Health Officers for the expansion of this type of program is one urging provision for grants-in-aid for comprehensive program development including training and radiation hazard control.

3. The Atomic Energy Commission carries special responsibilities in the promotion and development of atomic energy. It has done a tremendous amount of related research on radiological hazards to health. Necessarily, it will continue to be minutely informed regarding this subject, and its consultation will be sought. The Commission, however, could well give consideration to transferring its radiological health services having a public health aspect to the Public Health Service while continuing to maintain close liaison with that agency and its radiological health coordination and administrative functions. In other words, we would not want to see such a harmonious relationship interrupted. Furthermore, there is no need to do so, because none of us are in bureaucratic competition with each other, since as professionals we believe in a good program first, and next, the best means to effect it efficiently at minimum cost. This means taking advantage of all the resources available.

4. Throughout the years and throughout the Nation, State departments of health have been charged with protecting the health of the people in all of its aspects. Traditionally the enforcement of health standards and regulations is the function of the State governments through the State health departments. The same principle of State responsibility should be recognized, and hence applied to radiological health protection.

That, Mr. Chairman, completes my formal statement and, at this time, I wish to express my appreciation for the honor and privilege of being permitted to appear before you. I stand ready and willing to respond to any questions arising from this presentation.

Representative HOLIFIELD. Thank you very much for your presentation. Quite a few questions have been asked already as you went through it.

Are there any further questions?

If not, sir, we thank you.

We will call the next witness, Mr. Leo Goodman.

STATEMENT OF LEO GOODMAN, UNITED AUTOMOBILE WORKERS

Mr. GOODMAN. Mr. Chairman, I want to take this opportunity to thank the committee for giving me this opportunity to make an extemporaneous appearance. I apologize for not having a prepared statement, but I have been absorbed in some other matters regarding the work of the committee.

In commenting on the proposed bill pending before you, I would like to request again that the committee take this bill and reject it in toto as you have previous efforts of the Commission to dilute its responsibility regarding the health and safety obligation which you imposed upon it in the 1954 act. You recall in our previous discussions there were 17 different places in that statute in which you imposed upon the Atomic Energy Commission the obligation to protect the health and safety of the American people.

It is my opinion, and I think I have testified as to specific cases before you a number of times, that the Commission has failed to assume the obligations which you placed upon it. It is my opinion that this bill as written, as previous bills which have been presented under this intriguing title, "Cooperation With the States," is an effort to evade its responsibility and to put the situation in such a vague confusion that the Commission will not have responsibility, the States will not have the power or the possibility of protecting the health and safety of the public of this country at a time when it is now clear that there are very serious hazards lying ahead of us in the development of this science.

Our organization has strongly supported the development of this science. We believe it can be done safely. We believe that the present procedures are not doing it safely. I have here a stack of material merely to give you a few short quotes from these people themselves as to how they are not doing it safely, and why it is necessary that this committee insist that the Commission begin to assume the obligation which you imposed upon it under law.

First, in the opening of this set of hearing, you had some testimony regarding the adequacy of the standards which are now in effect. You recall that on March 4 of last year I raised with you the question

of the adequacy of the safety standards. I said at the time, "The safety standard itself is open to question. I call the attention of the committee to the fact that the permissible occupational exposure has been set by an official body at varying levels," and I showed that the maximum permissible limit has been dropped continuously from a level of 100 roentgens down to allegedly 5, but actually a formula of 5 times age minus 18. This standard is one that has been changed and was the subject of a letter to the chairman of the committee on April 24. Copies were sent to each member of the committee because we believe that the relationship between the NCRP and Mr. Lauriston Taylor, who testified on the opening day of this set of hearings, and the AEC has raised a serious question that the whole process of setting standards through an informal committee without any Government status, without any obligation to regulatory bodies, must be ended.

The NCRP and Mr. Lauriston Taylor said, you recall from the earlier hearings when I read his presentation to a special conference on the Economic Aspects of the Use of Isotopes held by UNESCO in Paris as follows: ". . . the establishment of permissible levels of radiation exposure is not basically a scientific problem. Indeed it is more a matter of philosophy, or morality, and of sheer wisdom."

Since that time, Mr. Lauriston Taylor has participated in two groups whose activities have been mentioned here extensively. One is the advisory committee to the Surgeon General, which issued a report properly known as the Morgan report, and, secondly, as a member of the ICRP, the International Commission, and he has seen fit, and this committee has had him testify here, regarding the method by which they set the standard.

In Mr. Sigal's letter to the committee of April 24, it was made clear that our organization resents and rejects this doubling of the occupational standard because we were advised by outstanding scientists that there is no scienific basis or justification for the doubling of the body burden of some radioisotopes, particularly strontium 90. The quotation which we have on page 2 from Dr. K. Z. Morgan states the basis upon which internal permissible doses are established. He said, "For the most part, these values are based on the assumption that the permissible amount of radioisotope in the body is one which will result in the accumulation of the radioisotope in the critical body organ, such that the critical organ will be exposed at a rate of 0.3 rem per week."

That 0.3 rem was the maximum permissible exposure level at the time that this statement was made, and at the time the calculations for the internal emitters were first made in 1953, but as a result of the 1955 U.N. conference and meetings held in 1956, in January 1957, the maximum permissible standard was cut by one-third.

Chairman ANDERSON. By one-third or to one-third?

Mr. GOODMAN. To one-third.

Representative HOLIFIELD. What you have said has been very true. You have criticized the doubling of the dose as being a doubling not based on scientific evidence, have you not?

Mr. GOODMAN. Yes.

Representative HOLIFIELD. Is it not true that the setting of the first dose was not based on scientific evidence, either?

Mr. GOODMAN. That was the burden of my testimony to this committee last year, and that is the reason I called for extensive studies

so as to provide a standard which had a basis in scientific fact and not the matter of philosophy and sheer wisdom.

Representative HOLIFIELD. Let us just explore that a little bit. If they are going to set it on the basis of scientific fact, then you are going to set it very high, much higher than that is there, because it is necessary in laboratory experiments to use much greater intensity in order to establish any scientific fact. Do you agree with me on that?

Mr. GOODMAN. No, sir.

Representative HOLIFIELD. You do not?

Mr. GOODMAN. No, sir. While I am not a geneticist, and I am not a biologist——

Representative HOLIFIELD. You do not agree with the testimony that has been given by practically every scientist—I know of no scientist who has not given this type of testimony—that when you come to the exposure of any organisms with radiation, there comes a level below which no detectable or observable effect can be observed or detected on the basis of experiments to date?

Mr. GOODMAN. Congressman, I was very intrigued by your inclusion of the word "practically."

Representative HOLIFIELD. What?

Mr. GOODMAN. You said practically every scientist testified to this effect.

Representative HOLIFIELD. Yes.

Mr. GOODMAN. I don't want to debate the science side of it with you.

Representative HOLIFIELD. No, but I think you made a very important statement here that you want the standard set on the basis of scientific facts that are demonstrable and acceptable by the majority of science.

Mr. GOODMAN. Yes, because the alternative and the method that Mr. Taylor is pushing so ardently not only in his role in the United States and around the world, and I would like to analyze that for you in a moment, is that we do statistical averaging of the populations and human beings.

Representative HOLIFIELD. That is a very nice way to get away from the argument, but I am not going to let you get away from it. The averages that have been set have been set as the result of prudent scientific judgment, and have not been set as a result of demonstrable laboratory techniques and experiments. They are extrapolations downward from the level of intensity which was necessary in order to obtain demonstrable and detectable deleterious effects on fruitflies and upon mice. I will stand on that statement. Therefore, if you insist that the standards be set on the basis of demonstrated scientific facts, then the conclusion you must come to is that they must be raised many degrees above what they are set now. I would not go along with you on that.

Mr. GOODMAN. I will prove to you, Congressman, that the alleged scientific judgments on which they are based now are subject to pressures other than scientific and that these political considerations are in my judgment dishonest and that there is need for a review by this committee on the very technical basis of the subject of our letter.

Representative HOLIFIELD. I am perfectly willing to review anything that is under the onus of what you say. But I am still telling you that there has been no scientific testimony before us to show us that

there can be a possible demonstration in a laboratory of deleterious effects upon any form of life when given at the rate set in the maximum permissible levels. If you can show me one scientific experiment at those levels, then I will surrender.

Mr. GOODMAN. At the U.N. conference in Geneva held last September, the U.S. Government gave each delegation a Geneva presentation series, including a number of volumes of which this volume on radiation, Radiation Biology and Medicine, was one. This volume, I would like to have you check it with me as I read it——

Representative HOLIFIELD. I accept your reading. I recognize you as a man of sincerity and integrity.

Mr. GOODMAN. Thank you, sir. While I am not a geneticist or biologist, I am also a man who is trying to find out what we can do to protect the workers who are subjected to decisions on Mr. Lauriston Taylor's sheer wisdom and morality.

Representative HOLIFIELD. Neither am I willing to take Mr. Lauriston Taylor's sheer wisdom and morality any more possibly than you are of any other witness. I must go by the preponderance of testimony which has been given to this committee just as you must go by the preponderance of testimony which you have access to, because neither one of us is a geneticist and scientist.

Mr. GOODMAN. At this point I would like to discuss who Mr. Lauriston Taylor is, if I may.

Representative HOLIFIELD. I want you to devote yourself to showing me any laboratory experiment which has shown a deleterious effect upon any organism at the rates of the permissible level which has been set.

Mr. GOODMAN. It seems to me, Congressman, you are reversing the responsibility for proof here.

Representative HOLIFIELD. No, I am not, because you are saying that the levels are not set on a scientific basis, and I agree with you.

Mr. GOODMAN. That is right.

Representative HOLIFIELD. But I also say they are set lower than any scientific experiment that has been presented to this committee which has demonstrated an observable and detectable effect. I am not objecting. You are objecting to nonscientific levels.

Mr. GOODMAN. But the present method is to permit the ICRP, which is a subdivision, according to their own report, of the International Congress of Radiology, at an international level, and their domestic affiliates under Mr. Lauriston Taylor to set them here, and this is like putting Jim Hoffa in charge of all the transportation regulatory agencies in the United States, or putting a chicken thief in charge of the chicken coop.

Representative HOLIFIELD. I am not interested in personalities. I am not here to either defend or offend Mr. Taylor or any groups. I am interested in the scientific principles which you are advancing. I again ask you to show me where any live organism has been deleteriously affected by the maximum permissible dose rates or accumulated dose rates permitted in the maximum permissible levels. If you show me that, then I will surrender.

Mr. GOODMAN. Mr. Holifield, I would like to refer you, if I may, to the vast accumulation of evidence on that point published by Ralph Lapp and Jack Schubert in their book on radiation.

Representative HOLIFIELD. If you will show me one statement of theirs where they have performed an experiment on radiation intensity of the maximum permissible levels in all of their books that has demonstrated a scientific fact in this field, again I tell you I will surrender.

Mr. GOODMAN. I will be happy to collate for you the information which I have on this subject. I am not a geneticist or a biologist.

(The material referred to follows:)

INTERNATIONAL UNION, UNITED AUTOMOBILE, AIRCRAFT & AGRICULTURAL IMPLEMENT WORKERS OF AMERICA—UAW,
Washington, D.C., July 8, 1959.

Hon. CHET HOLIFIELD,
Washington, D.C.

DEAR CONGRESSMAN HOLIFIELD: During the course of hearings on Federal-State relationships, you asked me to "show where any live organism has been deleteriously affected by the maximum permissible dose rate or accumulated dose rates permitted in the maximum permissible levels."

I offered to submit this information, and submit herewith, for inclusion in the record at that point, excerpt from a report on this subject published by the International Atomic Energy Agency in their bulletin of April 1959 under the heading, "Biological Effects of Small Radiation Doses."

Very truly yours,

LEO GOODMAN,
Atomic Energy Adviser.

[From International Atomic Energy Agency Bulletin, vol. 1, No. 1, April 1959, p. 7]

BIOLOGICAL EFFECTS OF SMALL RADIATION DOSES

To establish the maximum permissible radiation doses for occupational and other kinds of radiation exposure, it is necessary to know those biological effects which can be produced by very small radiation doses. This particular field of radiation biology has not yet been sufficiently explored. This holds true for possible delayed damage after occupational radiation exposure over a period of many years as well as for acute reactions of the organism to single low level exposures. We know that irradiation of less than 25 Roentgen units (r) is unlikely to produce symptoms of radiation sickness. We have, however, found indications that even smaller doses may produce certain instantaneous reactions which must not be neglected.

REACTIONS ON THE NERVOUS SYSTEM

Recently, more and more observations have pointed to the fact that the nervous system plays an important role in such instantaneous reactions. This, to a certain degree, is in contradiction to the generally held opinion that the nervous system is considerably resistant to ionizing radiation. Indeed, irremediable structural or functional damage to the nervous system can only be produced by extremely high doses. Some earlier observations and a number of more recent ones show, however, that the sensory organs and the nervous systems of animals may react quickly and easily to low doses. Roentgen had stated that the kind of radiation discovered by him produced an impression of light in the human eye. This effect, later called "Roentgenphen," has been studied in detail. Unfortunately, this sensation, especially in bright daylight, is so weak that it cannot serve as a warning signal against radiation. But lower animals seem to be considerably more sensitive in this respect. We were able to demonstrate in particular that many invertebrates react with reflex motions to astonishingly small radiation doses. For example, snails retract their feelers, clams shut their shells, and actinia, those beautifully colored sea lilies and anemones, retract their crown of tentacles. A few seconds after the beginning of the irradiation, small barnacles stop their rhythmic grasping actions. The behavior of insects can be disturbed by irradiation as well. For instance, ants show a lively disturbance immediately after irradiation; they act wildly in an attempt to flee rapidly from an irradiated area into a radiation-proof shelter. American scientists have recently reported certain disturbances in the behavior

of the water flea when subjected to radiation. Quantitative analysis of all these phenomena proves that they are reflexlike responses to ionizing radiation previously unknown.

For a variety of reasons, we can assume that this reaction to ionizing radiation has not been entirely lost during evolution, and that in man it is not restricted to the sensitivity of the eye mentioned above. It is the experience of radiotherapists that immediately after local irradiation of the abdominal region, disturbances of the normal intestinal and stomach motions may occur, such as a delay in the normal emptying of the stomach. They assume that the vegetative nervous system is involved.

It is only recently that instantaneous reactions on the nervous system have been observed, and particularly in Russian scientific literature, reports have appeared describing phases of nervous overexcitability after irradiation, changes of normal reflex responses and disturbances of the electrical currents of the brain, measurable with an electroencephalograph—all this due to very low radiation doses.

Representative HOLIFIELD. I am not interested in theories on this point. I am interested in facts.

Mr. GOODMAN. I am not interested in theories either, sir.

Representative HOLIFIELD. That is exactly what you are basing your presentation on, theories.

Mr. GOODMAN. I have not had a chance to give you very much of my presentation so I am not sure how you can characterize it, Congressman.

Representative HOLIFIELD. You made the statement that the doubling of the strontium 90 level was done on a nonscientific basis and I accepted it.

Mr. GOODMAN. Yes, sir.

Representative HOLIFIELD. Then I said to you that the setting of the first level was done on a nonscientific basis.

Mr. GOODMAN. And I accepted that.

Representative HOLIFIELD. Then I went ahead further and said that those levels are low in comparison to any demonstrated laboratory experiment on any live organism, whether it be insect or animal or human. I asked you to show me any laboratory experiment that would establish as a scientific fact a deleterious effect by those levels, and I say you can't show it, and there is not a scientist in the United States that can show it.

Mr. GOODMAN. I would like to have an opportunity outside this hearing, sir, to show you the report of the Japanese Academy of Science proving genetic change at very low levels.

Representative HOLIFIELD. At what levels?

Mr. GOODMAN. At low levels of exposure below the level that is considered the maximum permissible limit. In this conference of the International Conference of Radiation Research, the Russians reported, and it was confirmed, that there are effects on the blood at extremely low levels of exposure, sir.

Representative HOLIFIELD. Extremely low level is a nonscientific term. I can't accept it.

Mr. GOODMAN. I will be glad to go over the details.

Representative HOLIFIELD. If you will give it to me in terms of roentgens, curies, rems or any other recognized scientific measurement, I will be glad to have it.

Mr. GOODMAN. I will be glad to go over the details with you.

Chairman ANDERSON. We have another vote going on, and I will have to leave. You recognize my total lack of ability as a scientist.

Is it possible that we have known quite a bit about the effects of radiation for a long time from radium treatment, perhaps, I better say, and that certain scientists attempted to correlate or extrapolate the radium experience into what might happen with strontium?

Mr. GOODMAN. Yes.

Chairman ANDERSON. That may be what you have. While it is true that nobody is able to measure effects at the present time, they do think there is a scientific basis for the extrapolation from radium effects to strontium.

Mr. GOODMAN. Yes. But the important thing, Senator, is that in the face of recommendations to the contrary the NCRP has recently doubled the body burden for occupational workers primarily in my opinion to have an effect upon the whole population figure which they have not yet released. I say to you that this is contrary to the recommendations made by the leading organs in this country and to the recommendations which the U.S. Government distributed to the delegates at the U.N. conference in September, the very week that the ICRP report was adopted.

Chairman ANDERSON. Let me say to you, Mr. Goodman, if I miss some of it, I can't help it, but I do hope that it might resolve the sort of scientific argument between Mr. Holifield and yourself if you submitted a résumé of that in the record, and gave him a chance to check it at a subsequent time. I want to give you every opportunity in the world.

Mr. GOODMAN. Sir, we sent each member of the committee this letter weeks ago.

Chairman ANDERSON. And I read it and read it carefully. I am not trying to shut you off now. I am only saying if I am not here, I do hope you may submit material with annotations on it to show us where it comes from so that the committee staff can look it up and Mr. Holifield can examine it at a later date as much as he may wish to examine it.

Mr. GOODMAN. Yes. I would like to say one thing. The recommendations reported in this volume given to the delegates read in part, of the various recommendations agreed to presumably by four organizations, the Academy of Sciences, the British Medical Research Council, the ICRP and the NCRP, that "No changes are recommended for isotopes which are referred to, radium 226 as a base for the dose, such as plutonium 239 and strontium 90." That was circulated as our position to the world at the U.N. conference in Geneva in September and the ICRP adopted its report that week, after receiving this, and then the U.S. authorities reversed our position and doubled the amount. It may be that the revelations that you made regarding fallout and regarding Minnesota wheat and regarding the problems of bread and water and milk may have resulted in, shall I say, a molding of scientific judgment. It is this that we resent, because the standard is applied to the worker on the job. The standard is changed at the occupational level in order to meet these other factors.

Chairman ANDERSON. You are in a field now that interests me very much. I could not understand how we took one position apparently, and then came back home and reversed the position and doubled the standard. That I have never understood. I further assumed as I thought Mr. Holifield did, that the first one was based on a horseback opinion, and the last one was a double horseback opinion.

Representative HOLIFIELD. I might say that I am not sustaining the doubling of the dose because I do not have the scientific competence to say whether the first dose was right or the second dose. But as far as us taking a position, it is nothing new in the scientific world to change positions. I think in these hearings we have had a great many scientific positions changed, and I point out to you, for instance, that our scientific position on the detection of bombs was very drastically changed. I have no way of judging personally whether it was done for political reasons or for scientific reasons. But a galaxy of scientists appeared before us and said it was for scientific reasons.

Mr. GOODMAN. They were agreeing with the official position, many of them.

Representative HOLIFIELD. You may impute to every witness that appears before this committee some very devious position, if you wish. That is within your right. I make my own judgment on each witness' testimony, but not on the basis of assertions of other witnesses that they are doing it for devious reasons.

Mr. GOODMAN. I raise the question as to the role of the United States delegates in the ICRP. In this connection I would like to quote from a statement of Lauriston Taylor as published in the Journal of Health, Physics Society, for September 15, 1958, in an article entitled, "History of the International Commission on Radiological Protection," page 99. He reports that in the process of trying to reach an area of agreement, apparently, in regard to the setting of a standard, on probably the most vital single sensitive exposure in this whole health problem, the proposals of the United Kingdom of an average per capita gonadal dose of 3 roentgens to 20 roentgens, the proposal of the United States. I don't know by which method the U.S. delegates arrived at a figure 7 times that arrived at by the scientists of the United Kingdom.

Representative HOLIFIELD. Do you know by what method the United Kingdom arrived at theirs?

Mr. GOODMAN. No.

Representative HOLIFIELD. I don't either.

Mr. GOODMAN. But it does seem to me——

Representative HOLIFIELD. But you accept one and reject the other. I don't accept either one of them.

Mr. GOODMAN. I have not even been able to complete the sentence.

Representative HOLIFIELD. I don't believe either one to be scientifically established fact.

Mr. GOODMAN. I have not been able to complete the sentence, so I am not sure you can know what I accept. I do know that I resent the phrasing that Mr. Taylor reports here. He says a middle value of 10 r was informally accepted. It seems to me that is not the basis upon which the most important single radiation exposure in the world level should be set.

Representative HOLIFIELD. My friend, when you realize that you are dealing in an area where it is not susceptible to scientific proof, then there comes a time when reasonable men arrive at a compromise. The compromise may be wrong or it may be right. The 20 might have been right or the 3 might have been right. But where there is a diversity of opinion in a field that is unexplored and where the facts cannot be ascertained, it is usually a scientific habit to arrive at what they call a factor of degree. This apparently is what hap-

pened there. I would accuse those who deserted their position of 3 of the same cupidity and the same degree of deviousness as those who deserted the level of 20. If you are going to accuse any of them of being devious, that is. Can't we give both sides the credit of being honest and being concerned and yet not being able to prove their point, and thereby arriving at a compromise? I think this frequently happens in the negotiation of wages, does it not, between the employee and employer?

Mr. GOODMAN. Yes, but at least we have representation at that level.

Representative HOLIFIELD. You mean to say that the 100 or more U.S. citizens that are in the NCRP—perhaps it is 150—that there is no representation there of scientific viewpoint?

Mr. GOODMAN. I would like if I may——

Representative HOLIFIELD. Or would you like to have a labor representative who has had no training in physics go on that board?

Mr. GOODMAN. I would like to insert in the record, if I may, at this point, an evaluation of the competency of the NCRP by Jack Schubert and Ralph Lapp.

Representative HOLIFIELD. I am sure that will be accepted.

(The information referred to follows:)

[From Bulletin of the Atomic Scientists, vol. XIV, No. 1, January 1958]

(By Jack Schubert and Ralph E. Lapp)

Consider the membership of the influential U.S. National Committee on Radiation Protection (NCRP): Of the 36 members, nearly one-half are physicians, eight representing radiological groups and the other representing the military and industry; while nearly all the rest are physicists, with a few representing manufacturers of radiation equipment. Essentially, no "pure" scientists representing such fields as cellular physiology, biochemistry, genetics, trace element metabolism, and biostatistics are on the committee. The NCRP, being the principal committee concerned with all aspects of radiation, should represent a wide spectrum of scientific fields—one made up of all geneticists, for example, is no more qualified than a committee consisting only of physicians, or statisticians. One of the underlying reasons why the recommendations of the report of the National Academy of Sciences (1956) clashed with NCRP views is probably the different membership of the advisory committees involved.

Representative HOLIFIELD. Mr. Schubert was invited to come before the committee and testify on bomb-test radiation, and he came before the committee and presented a paper on the effect of X-ray radiation of an intensity of from 2 to 5 roentgens on the fetus in a pregnant woman. As chairman of the committee, I permitted him to go ahead and present his full paper, although it was not a paper on the subject of the hearing. It did make more sensational copy than if he had testified on the 0.7 of a roentgen over 14 years of accumulation of bomb-test fallout. So we will be glad to have more of that. We hope this particular matter that you are submitting is pertinent to the record.

Mr. GOODMAN. In the committee record dated May 4, 1959, there is a statement by Maurice Visscher on the shortcomings of this change of body burden standards which our letter relates to.

You have just had a witness here representing the study group of the Michigan Law School at Ann Arbor. This gentleman discussed the inability of States to participate fully. I concur. Yet it was interesting to me that he was the very official for the Commission who froze out from representation in the Sandusky matter (NACA—

Docket 50–30, p. 26) which I have referred to at a number of hearings this year, the position of the State regarding the lack of safety in that case.

Representative HOLIFIELD. What do you mean by the words "froze out"? What was his position? We he working for the Commission at the time?

Mr. GOODMAN. He was an attorney for the Commission, both in the Detroit Edison case over a period of 2 years, and he was the attorney for the so-called separated staff of the Commission in the matter relating to the Sandusky case.

Representative HOLIFIELD. What was his name?

Mr. GOODMAN. His name was Lee Hydeman. I would like to insert in the record, if I may, at this point the exchange between Mr. Hydeman and Dr. Dwork of the State of Ohio when Dr. Dwork attempted on behalf of the State of Ohio to object to the granting of a license to the Sandusky reactor.

Representative HOLIFIELD. Is this pertinent matter to our discussion today?

Mr. GOODMAN. Yes, of course. It relates directly, sir, to whether or not the States participate and can participate in the making of decisions. You recall that Mr. Berman and Mr. Hydeman made a recommendation to you that the sole decision regarding the location of a reactor should be up to the AEC, and that the States have not been able to participate because of a lack of competence. I think that comes with lack of grace from a man who participated in the Commission policies to prevent the States from participating when they sought to as they did in the Sandusky case.

(The information referred to follows:)

[From NACA hearing Jan. 16, 1958]

Mr. HYDEMAN. May I ask one question?

Dr. Dwork, from the State of Ohio rendered an appearance. Was this in the nature of a limited appearance under the Commission's rules of practice?

Dr. DWORK. Being a physician, I am not sure I can legally interpret that at all.

PRESIDING OFFICER. Why don't you come up here so you can see this Mickey Mouse picture we are going to have in a minute or two. We will be glad to have you. Bring up your papers.

Dr. DWORK. What I have to say I won't need any papers.

PRESIDING OFFICER. All right, sir.

Mr. HYDEMAN. I thought you might want to make some remarks in connection with the proceeding.

Dr. DWORK. I do.

PRESIDING OFFICER. We will permit the remarks under limited appearance, if that is agreeable to counsel.

Mr. DEMBLING. Yes.

Mr. HYDEMAN. Yes.

PRESIDING OFFICER. I think that is probably what you want to do.

Dr. DWORK. Fine.

PRESIDING OFFICER. Do you want to be heard now?

Dr. DWORK. At your pleasure.

PRESIDING OFFICER. Why don't we proceed and let Mr. Dembling put in his direct case, and we will hear from you before we conclude.

Anything further in the way of preliminary matters?

Mr. HYDEMAN. No, Mr. Examiner.

Mr. DEMBLING. I was going to suggest, Mr. Examiner, that perhaps Dr. Dwork make his statement at the present time so that in our case-in-chief if he brings up any questions that might be covered, we could cover them right at the same time; if that is agreeable to the parties.

Mr. HYDEMAN. If that is agreeable to Dr. Dwork I have no objection.

PRESIDING OFFICER. Very well. I will be glad to hear you, Dr. Dwork.

Dr. DWORK. First, let me identify myself. I am Dr. Dwork, director of health in the State of Ohio. This is the first such appearance that I have made, although we have other installations in the State.

We, I would like to say, are anxious and desirous of having this installation in the State of Ohio. We feel that the presence of such an installation will create, if nothing else, a milieu for other installations which we think is going to be the growing field.

We would like to see a nucleus of people who have know-how from which others can draw on for information, consultation, and advice.

We think that this is important to the total growth of the State. I want to establish that first, that we are anxious and desirous of having that installation.

As director of health, however, my concern is with the health of the people of Ohio. This is set by law.

We do not in our department have people who are competent, we believe, in either the building or the operation of reactors and their evaluation. It is therefore, necessary for us whenever possible, where our knowledge is lacking to consult the Public Health Service for such additional information as we would require.

Our position here, Mr. Examiner, is briefly this: In reviewing what material we have, the review made by the Committee on Reactor Safeguards indicates that there is some misgivings on their part with regard to both the site and what is going to be done at that site.

If this committee of the AEC had some misgivings, our position is such that naturally, we must have some misgivings.

It would be my feeling that although we are keenly desirous of having this facility in Ohio, that until such time as there is ample assurance which is acceptable to the Committee on Reactor Safeguards, an operational license be delayed.

That, basically, is our position, Sir.

PRESIDING OFFICER. Thank you, Dr. Dwork. I am sure the Commission appreciates having the position of the State of Ohio in this matter.

Mr. GOODMAN. That raises the whole question which I referred to, and which I feel is essentially important. This is with regard to the Advisory Committee on Reactor Safeguards. I might say they submitted a report, and you had a hearing on the matter, though I did not see that there was any reference or any discussion to the cases which we raised. I think the action of the States is fundamentally important to this matter, because there have been efforts by the States to participate. There have been efforts by the States to inform themselves. There are in the record a number of cases where it has been made impossible by the AEC for the State to even get copies of reports, the exchange between yourself and the Governor of Michigan in regard to the Detroit Edison case which was recently the subject of some discussion in another committee. This ACRS committee in my opinion needs strengthening at the Federal level. It needs to be made independent. I used the word "pressure" in my last appearance, and I think that only if its position is strengthened can it be protected from unnecessary and undue pressure.

I would like to call the committee's attention to a section of their report to you which was used for your indemnity and advisory committee on reactor safeguards hearings on page 55. There is another one of the reports of the committee to the Commission, and the subject of this one is the Lockheed radiation effects reactor. The final paragraph of that reads, and I submit in relation to my previous charges of the use of "pressure":

> If the additional risks entailed in operating a reactor at substantial power in an unshielded position are compensated by the prospect of getting important information that cannot be obtained by safer methods than in the present instance, these additional risks may be considered acceptable. Within the limited knowledge of radiation damage effects, the committee is doubtful that the bene-

fits of irradiating large scale aircraft components will compensate the additional risks of doing so by the proposed methods, but is willing to defer to superior judgment in this regard.

"Deferring to superior" judgment is an example of what I meant to you earlier in the pressures which were being brought to permit the construction of reactors which in the judgment of the Advisory Committee on Reactor Safeguards are unsafe.

Representative HOLIFIELD. At this time may I direct the staff to direct a letter on that so that we can do the Committee on Reactor Safeguards justice, and ask for an explanation on that particular statement so that it can be placed in the record at this point?

(The letters referred to follow:)

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS,
U.S. ATOMIC ENERGY COMMISSION,
Washington, D.C., June 26, 1959.

Mr. JAMES T. RAMEY,
Executive Director,
Congress of the United States,
Joint Committee on Atomic Energy,
Washington, D.C.

DEAR MR. RAMEY: This is in reply to your letter of June 19, 1959, regarding a letter from the Advisory Committee on Reactor Safeguards of August 5, 1958, on the Lockheed radiation effects reactor.

In the August 5, 1958, letter the ACRS expressed its views of the safety of the design and operation of this unshielded and uncontained reactor. In the last paragraph of this letter the committee pointed out that it was not judging the value of the military testing program. The phrase, "to defer to superior judgment" relates to this radiation effects testing program and not to the safety of the proposed operation. The committee recognizes its responsibility to give advice on safety and as a policy does not advise on program matters.

Sincerely yours,

C. ROGERS MCCULLOUGH, *Chairman.*

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D.C., June 19, 1959.

Dr. C. ROGERS MCCULLOUGH,
Chairman, Advisory Committee on Reactor Safeguards, U.S. Atomic Energy Commission, Washington, D.C.

DEAR DR. MCCULLOUGH: During the hearings before the Joint Committee on Federal-State Relationships on May 22, 1959, Mr. Leo Goodman testified concerning the letter of the Advisory Committee on Reactor Safeguards dated August 5, 1958, on the Lockheed radiation effects reactor. This letter appears at pages 55 and 56 of the Joint Committee print entitled "AEC Report on Indemnity Act and Advisory Committee on Reactor Safeguards" (April 1959), a copy of which is enclosed for your information. Mr. Goodman's testimony on this point appears at pages 675–676 of the transcript of the May 22 hearings.

At the conclusion of Mr. Goodman's remarks, Congressman Holifield stated that he would direct the staff to send a letter to the Advisory Committee on Reactor Safeguards and ask for an explanation of the final paragraph in the August 5, 1958, letter. (Transcript, p. 676.)

Pursuant to previous discussions with the staff of the Joint Committee, it is requested that the Advisory Committee submit as soon as possible any statement it wishes to make concerning its August 5, 1958, letter or Mr. Goodman's testimony, for insertion in the record of the May 22, 1959, hearings.

Sincerely yours,

JAMES T. RAMEY, *Executive Director.*

Representative DURHAM. Mr. Goodman, I don't know what you want. You quoted from all those different documents, but certainly you could be of more help to the committee and constructive if you would tell us exactly how you would do this, and what you want done, instead of all these extracts from their documents. I think most of them have been read. I read that big book you have there on medicine and biology in Geneva.

Representative HOLIFIELD. In your defense of the States I wonder if you want us to turn this over to the States.

Mr. GOODMAN. I have not been defending the States. I said in this case the attack that the States do not participate comes with ill grace from one who tried to prevent the States from participating in the Sandusky hearing. As a matter of fact, I would like at this time if I may to say that the States are incompetent to handle this whole problem, and the best proof of that is the decision that apparently was either made by this committee or jointly by the Commission and the Public Health Service that responsibility for safety of workers in the uranium mines lies in some vague uncertain area. I don't know where that decision was made, but it is clear that no organ of government has assumed the responsibility, and you have had testimony here in the last few days that the exposure levels to radon gas and their daughters is excessively above the safe limit.

Representative DURHAM. You said that the Commission is incompetent to handle this matter in your statements recently in criticizing them. Where do you go from here?

Mr. GOODMAN. I think there is a very simple solution to the problem, sir.

Representative DURHAM. I would like to hear it if you have a simple solution. You have more than anybody else has had who appeared before this committee in the last 10 years, if you have a simple solution.

Mr. GOODMAN. If I may develop my case.

Representative DURHAM. Don't make it too long.

Mr. GOODMAN. I will be happy not to. That will merely depend on how many interruptions I have from the bench.

Testimony of Mr. Jacoe——

Representative DURHAM. Let us get away from personalities and have your opinion.

Mr. GOODMAN. I am trying to give you some facts to lay a basis for my recommendation, sir.

Representative HOLIFIELD. Proceed.

Mr. GOODMAN. To discuss the environmental studies that have been made in the mines in the United States regarding radon exposure, and he pointed out the effort of the State of Colorado in this regard, and the steps they have taken to hire one additional man for this year. He states on page 3 of his statement,

> Of the possibility of achieving a periodic inspection perhaps as often as at 4 to 6 month intervals.

This is in sharp contrast with the report and recommendations released at the U.N. conference in Geneva by the French Government in their handling of the same problem. I am quoting now from paper A/, 15/1238, in which they report that because of the rapid accumulation of radon gas, it is necessary to check at least once a week, and quoting from page 7,

Samplings are taken at least once a week at all mine workings, headings and pillar workings and return airways at the drilling and second after blasting on the return of the workers and the last during wetting down. When anomalies were observed, the samples were taken more frequently and at the end of each week the average concentrations calculated.

The interesting thing about this and the tie-back to my earlier testimony in regard to both Mr. Lauriston Taylor's approach and the NCRP committee approach, and the problem which this committee has to face is the cost factor of safety. It was interesting to me that in this paper the French Government reported, and I read now from a section on page 13 entitled "Bearing on Cost Price."

It goes without saying that the institution and operation of the control system is somewhat expensive to the operator. The cost of mining operations is thereby increased by 1 percent.

Representative HOLIFIELD. Let us put this in the proper perspective. What are you reading from?

Mr. GOODMAN. I am reading from the report by the French Government to the UN conference on measures adopted in French uranium mines to insure the protection of personnel.

Representative HOLIFIELD. I am sure they are very good and I approve of them. You spoke previous to that to radon gas in the mines in Colorado.

Mr. GOODMAN. Yes.

Representative HOLIFIELD. I am sure from the information that has been placed before us that is a bad condition.

Mr. GOODMAN. Yes, sir.

Representative HOLIFIELD. But those mines are privately owned mines. They are not owned by any Federal body that I know anything about. They come under the jurisdiction of the Colorado State mining laws, and the Bureau of Mines. Is this not true? Any regulation for safety?

Mr. GOODMAN. This is precisely what I am objecting to.

Representative HOLIFIELD. I don't mind your objecting, but why aren't you objecting to the State Legislature of Colorado, or before a committee which has jurisdiction? We have no jurisdiction over that, Mr. Goodman.

Mr. GOODMAN. This is an abdication of responsibility which I think is unnecessary.

Representative HOLIFIELD. On the part of this committee?

Mr. GOODMAN. Yes.

Representative HOLIFIELD. You mean to say that we have legal right to go into the State of Colorado and regulate the conditions in the mines of Colorado? Are you telling this committee that?

Mr. GOODMAN. I believe you have a responsibility to protect the health and safety in all aspects of the developing atomic energy industry, and the one portion that this committee most importantly developed in the United States was the expansion of uranium mining. Therefore, you have a responsibility to the miners, some 10,000 of whom are faced with very inadequate protection.

Representative HOLIFIELD. Will you get a legal opinion from Mr. Siegel as to this committee's jurisdiction over the privately owned mines on the Colorado Plateau, or anywhere else, and that it is this committee's jurisdiction? Will you get that and present it to the committee?

Mr. GOODMAN. I would be happy to. Having raised this subject of the matter of cost, I would like to go to my earlier point in the employee radiation hearings in answer to the question of setting adequate standards as it relates to the cost of operation in this industry. I requested at that time that the committee seek from the AEC the facts of the cost of safety. They may have submitted it to the committee. I have approached Mr. Ramey almost every single day since, and have to this day been unable to find out if they answered that request for information on cost factors. Therefore, I am obligated to rely at this time on the public record for the information which they published recently.

(The information referred to follows:)

INTERNATIONAL UNION, UNITED AUTOMOBILE, AIRCRAFT & AGRICULTURAL IMPLEMENT WORKERS OF AMERICA, UAW,
Washington, D.C., July 10, 1959.

Hon. CHET HOLIFIELD,
Washington, D.C.

DEAR CONGRESSMAN HOLIFIELD: In connection with your request for legal opinion regarding Federal jurisdiction over privately owned mines, I am attaching for inclusion in the record a copy of Public Law 552 of the 82d Congress approved July 16, 1952, entitled, "An act relating to certain inspections and investigations in coal mines for the purpose of obtaining information relating to health and safety conditions, accidents and occupational diseases therein, and for other purposes," which amends Public Law 49 of the 77th Congress approved May 7, 1941.

These laws provide ample precedent for Federal action in protecting the health and safety of miners, coal as well as uranium.

Very truly yours,

LEO GOODMAN,
Atomic Energy Adviser.

[PUBLIC LAW 49—77TH CONGRESS]

[CHAPTER 87—1ST SESSION]

[H. R. 2082]

AN ACT

Relating to certain inspections and investigations in coal mines for the purpose of obtaining information relating to health and safety conditions, accidents, and occupational diseases therein, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior, acting through the United States Bureau of Mines, is hereby authorized and empowered to make or cause to be made annual or necessary inspections and investigations in coal mines the products of which regularly enter commerce or the operations of which substantially affect commerce—

(a) For the purpose of obtaining information relating to health and safety conditions in such mines, the causes of accidents involving bodily injury or loss of life in such mines, or the causes of occupational diseases originating in such mines, whenever such health or safety conditions, accidents, or occupational diseases burden or obstruct commerce or threaten to burden or obstruct commerce.

(b) For the purpose of obtaining information relating to health and safety conditions in such mines, the causes of accidents involving bodily injury or loss of life in such mines, or the causes of occupational diseases originating in such mines, as a basis for determining the most effective manner in which the public funds made available for the protection or advancement of health or safety in coal mines, and for the prevention or relief of accidents or occupational diseases therein may be expended for the accomplishment of such objects.

(c) For the purpose of obtaining information relating to health and safety conditions in such mines, the causes of accidents involving bodily injury or loss of life in such mines, or the causes of occupational diseases, originating in such mines, as a basis for the preparation and dissemination of reports, studies, statistics, and other educational materials pertaining to the protection or advancement of health or safety in coal mines and to the prevention or relief of accidents or occupational diseases in coal mines.

(d) For the purpose of obtaining information relating to accidents involving bodily injury or loss of life in such mines or relating to occupational diseases originating in such mines, to be transmitted to the Bureau of the Census for use in connection with the preparation and compilation of the various Census reports.

(e) For the purpose of obtaining information relating to health and safety conditions in such mines, the causes of accidents involving bodily injury or loss of life in such mines, or the causes of occupational diseases originating in such mines, to be transmitted to the Congress for its consideration in connection with legislative matters

involving health and safety conditions, accidents, or occupational diseases in coal mines.

SEC. 2. The Secretary of the Interior, acting through the United States Bureau of Mines, is further authorized and empowered to make or cause to be made the inspections and investigations provided for in section 1 of this Act at other than annual intervals at any time in his discretion when the making of such inspections or investigations in the mine concerned will be in furtherance of the purposes of this Act.

SEC. 3. The Secretary of the Interior acting through the United States Bureau of Mines, or any duly authorized representative of such Bureau, shall be entitled to admission to any coal mine the products of which regularly enter commerce or the operations of which substantially affect commerce, for the purpose of making any inspection or investigation authorized under section 1 or section 2 of this Act.

SEC. 4. Any owner, lessee, agent, manager, superintendent, or other person having control or supervision of any coal mine subject to the provisions of section 1 or section 2 of this Act who refuses to admit the Secretary of the Interior, acting through the United States Bureau of Mines, or any duly authorized representative of such Bureau, to such mine, pursuant to the provisions of section 3 of this Act, shall be guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine not exceeding $500 or by imprisonment not exceeding sixty days, or by both.

SEC. 5. Every owner, lessee, agent, manager, superintendent, or other person having control or supervision of any coal mine the products of which regularly enter commerce or the operations of which substantially affect commerce shall furnish to the Secretary of the Interior, acting through the United States Bureau of Mines, or to any duly authorized representative of such Bureau, upon request, complete and correct information to the best of his knowledge concerning any or all accidents involving bodily injury or loss of life which occurred in such mine during the calendar year in which the request is made or during the preceding calendar year.

SEC. 6. The Secretary of the Interior, acting through the United States Bureau of Mines, is hereby authorized and directed—

(a) To report annually to the Congress, either in summary or detailed form, the information obtained by him under this Act, together with such findings and comments thereon and such recommendations for legislative action as he may deem proper;

(b) To compile, analyze, and publish, either in summary or detailed form, the information obtained by him under this Act, together with such findings concerning the causes of unhealthy or unsafe conditions, accidents, or occupational diseases in coal mines, and such recommendations for the prevention or amelioration of unhealthy or unsafe conditions, accidents, or occupational diseases in coal mines as he may deem proper;

(c) To prepare and disseminate reports, studies, statistics, and other educational materials pertaining to the protection or advancement of health or safety in coal mines and to the prevention or relief of accidents or occupational diseases in coal mines;

(d) To expend the funds made available to him for the protection or advancement of health or safety in coal mines, and for the prevention or relief of accidents or occupational diseases therein, in such

lawful manner as he may deem most effective in the light of the information obtained under this Act to promote the accomplishment of the objects for which such funds are granted;

(e) To transmit to the Director of the Census, either in summary or detailed form, the information obtained by him under this Act, for use in connection with the preparation and compilation of the various Census reports; and

(f) To make available for public inspection, either in summary or detailed form, the information obtained under this Act, as soon as practicable after the acquisition of such information.

SEC. 7. The execution of the provisions of this Act shall devolve upon the United States Bureau of Mines and the Secretary of the Interior may designate other bureaus or offices in the Department of the Interior to cooperate with the United States Bureau of Mines for such purpose. In order to promote sound and effective coordination of Federal and local activities within the field covered by this Act, the Secretary of the Interior, and the several bureaus and offices under his jurisdiction, shall cooperate with the official mine inspection or safety agencies of the several States and Territories, and, with the consent of the proper authorities thereof, may utilize the services of such agencies in connection with the administration of this Act. Copies of all findings, recommendations, reports, studies, statistics and information made public under the authority of clauses (b), (c), and (f) of section 6 of this Act shall, whenever practicable, be furnished any cooperating State or Territorial agency which may request the same.

SEC. 8. The Secretary of the Interior, acting through the United States Bureau of Mines, may, in his discretion, create and establish an advisory committee composed of not more than six members to exercise consultative functions, when required by the Secretary, in connection with the administration of this Act. The said committee shall be composed of representatives of coal-mine owners and of representatives of coal-mine workers in equal number. The members of said committee shall be appointed by the Secretary of the Interior without regard to the civil-service laws.

SEC. 9. The Secretary of the Interior, acting through the United States Bureau of Mines, shall have authority to appoint, subject to the civil-service laws, such officers and employees as he may deem requisite for the administration of this Act; to fix, subject to the Classification Act of 1923, as amended, the compensation of officers and employees so appointed; and to prescribe the powers, duties, and responsibilities of all officers and employees engaged in the administration of this Act: *Provided, however*, That in the selection of persons for appointment as coal-mine inspectors no person shall be so selected unless he has the basic qualification of at least five years' practical experience in the mining of coal, and is recognized by the United States Bureau of Mines as having the training or experience of a practical mining engineer in those essentials necessary for competent coal-mine inspection; and in detailing coal-mine inspectors to the inspection and investigation of individual mines, due consideration shall be given to their previous practical experience in the work of mining coal in the State, district, or region where such inspections are to be made.

SEC. 10. There are hereby authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, such sums as may be necessary for the due execution of this Act.

SEC. 11. For the purposes of this Act, the term "commerce" means trade, traffic, commerce, transportation, or communications between any State, Territory, possession, or the District of Columbia and any other State, Territory, or possession, of the United States, or between any State, Territory, possession, or the District of Columbia and any foreign country, or wholly within any Territory, possession, or the District of Columbia, or between points in the same State if passing through any other State or through any Territory, possession, or the District of Columbia or through any foreign country.

SEC. 12. If any provision of this Act, or the application thereof to any person or circumstance, is held invalid, the remainder of this Act, and the application of such provision to other persons or circumstances, shall not be affected thereby.

Approved, May 7, 1941.

Public Law 552 - 82d Congress
Chapter 877 - 2d Session
S. 1310

AN ACT

All 66 Stat. 692.

To amend Public Law 49, Seventy-seventh Congress, so as to provide for the prevention of major disasters in coal mines.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act entitled "An Act relating to certain inspections and investigations in coal mines for the purpose of obtaining information relating to health and safety conditions, accidents, and occupational diseases therein, and for other purposes", approved May 7, 1941, is amended by adding at the end thereof the following new title:

Federal Coal Mine Safety Act, amendment.
55 Stat. 177.
30 U.S.C. §§ 4f-4o.

"TITLE II—PREVENTION OF MAJOR DISASTERS IN MINES

"DEFINITIONS AND EXEMPTION

"SEC. 201. (a) For the purposes of this title—

"(1) The term 'Board' means the Federal Coal Mine Safety Board of Review created by section 205.

"(2) The term 'Bureau' means the Bureau of Mines.

"(3) The term 'certified person', when used to designate the kind of person to whom the performance of a duty in connection with the operation of a mine shall be assigned, means a person who is qualified under the laws of the State in which such mine is located to perform such duty, except that in a State the laws of which do not provide for such qualification, the term means a person deemed by the operator of such mine to be qualified to perform such duty.

"(4) The term 'commerce' means trade, traffic, commerce, transportation, or communications between any State, Territory, possession, or the District of Columbia and any other State, Territory, or possession, of the United States, or between any State, Territory, possession, or the District of Columbia and any foreign country, or wholly within any Territory, possession, or through any other State or through any Territory, possession, or the District of Columbia or through any foreign country.

"(5) The term 'Director' means the Director of the Bureau of Mines.

"(6) The term 'duly authorized representative of the Bureau' means a person appointed under section 109 of title I or under section 212 of this title, and authorized in writing by the Director to perform the duties of a duly authorized representative of the Bureau as provided in sections 202, 203, and 206 of this title.

30 U.S.C. § 4n.
Post, p. 710.

"(7) The term 'mine' means an area of land including everything annexed to it by nature and all structures, machinery, tools, equipment and other property, real or personal, placed upon, under or above its surface by man, used in the work of extracting bituminous coal, lignite or anthracite, from its natural deposits in the earth in such area and in the work of processing the coal so extracted. The term 'mine' does not include any strip mine. The term 'work of processing the coal' as used in this paragraph means the sizing, cleaning, drying, mixing and crushing of bituminous coal, lignite or anthracite, and such other work of processing such coal as is usually done by the operator, and does not mean crushing, coking, or distillation of such coal or such other work of processing such coal as is usually done by a consumer or others in connection with the utilization of such coal.

"(8) The term 'operator' means the person, partnership, association or corporation operating a mine and owning the right to do so.

All 66 Stat. 693.

"(9) The term 'permissible', as applied to equipment used in the operation of a mine, means equipment to which an approval plate, label, or other device is attached as authorized by the Director under section 212 (a), and which meets specifications which (A) are prescribed by the Director for the construction and maintenance of such equipment, and (B) are designed to assure that such equipment will not cause a mine explosion or mine fire.

"(10) The term 'premises' when used in referring to the premises of a mine, means the land within the mine's area of land.

"(11) The term 'rock dust' means pulverized limestone, dolomite, gypsum, anhydrite, shale, talc, adobe, or other inert material, preferably light colored, (A) 100 per centum of which will pass through a sieve having 20 meshes per linear inch and 70 per centum or more of which will pass through a sieve having 200 meshes per linear inch; (B) the particles of which when wetted and dried will not cohere to form a cake which will not be dispersed into separate particles by a light blast of air; and (C) which does not contain more than 5 per centum of combustible matter, nor more than a total of 5 per centum of free and combined silica (SiO_2).

Nonapplicability.

"(b) This title shall not apply to any mine in which no more than fourteen individuals are regularly employed underground.

"INSPECTIONS

"SEC. 202. (a) For the purpose of determining whether a danger described in section 203 (a) exists in any mine the products of which regularly enter commerce or the operations of which substantially affect commerce, or whether any provision of section 209 is being violated in any such mine, or whether any such mine is a gassy mine as prescribed in section 203 (d), the Director shall cause an inspection of each such mine to be made by a duly authorized representative of the Bureau at least annually. The Director shall also make, or cause duly authorized representatives of the Bureau to make, such special inspections of such mines as may be required by section 203 (c) and section 206, and such other inspections of such mines as he deems necessary for the proper administration of this title.

Coordination with States.

"(b) (1) In order to promote sound and effective coordination in Federal and State activities within the field covered by this title, the Director shall cooperate with the official mine inspection or safety agencies of the several States.

State plan.

"(2) Any State desiring to cooperate in making the inspections required under this title may submit, through its official mine inspection or safety agency, a State plan for carrying out the purposes of this subsection. Such State plan shall—

"(A) designate such State mine inspection or safety agency as the sole agency responsible for administering the plan throughout the State and contain satisfactory evidence that such agency will have the authority to carry out the plan,

"(B) give assurances that such agency has or will employ an adequate and competent staff of inspectors qualified under the laws of such State to make mine inspections within such State,

"(C) give assurances, that upon request of the Director or upon request of an operator under section 203 (e) (1), the agency will assign inspectors employed by it to participate in inspections to be made in such State under this title, and

"(D) provide that the agency will make such reports to the Director, in such form and containing such information, as the Director may from time to time require.

"(3) The Director shall approve any State plan or any modification thereof which complies with the provisions of paragraph (2) of this subsection. He shall not finally disapprove any State plan or modification thereof without first affording the State agency reasonable notice and opportunity for hearing. Director's approval.

"(4) Whenever the Director, after reasonable notice and opportunity for hearing to the State agency, finds that in the administration of the State plan there is— Withdrawal of approval.

"(A) a failure to comply substantially with any provision of the State plan; or

"(B) a failure to afford reasonable cooperation in administering the provisions of this title,

the Director shall notify such State agency of his withdrawal of approval of such plan and upon receipt of such notice such plan shall cease to be in effect.

"(5) No inspection of a mine shall be made by a representative of the Bureau under this title in any State in which a State plan is in effect unless a State inspector participates in such inspection in accordance with such plan, except where, in the Director's judgment, an inspection is urgently needed to determine whether a danger described in section 203 (a) exists in such mine, and participation by a State inspector would unreasonably delay such inspection. Inspection of mine.

"(c) The Director, any duly authorized representative of the Bureau, any State inspector assigned in accordance with a State plan, and any independent inspector appointed under section 203 (e) (3) shall be entitled to admission to any mine the products of which regularly enter commerce or the operations of which substantially affect commerce, for the purpose of making any inspection authorized under this title. Persons admitted to mine.

"FINDINGS AND ORDERS

"SEC. 203. (a) (1) If a duly authorized representative of the Bureau, upon making an inspection of a mine as authorized in section 202, finds danger that a mine explosion, mine fire, mine inundation, or man-trip or man-hoist accident will occur in such mine immediately or before the imminence of such danger can be eliminated, he shall also find the extent of the area of such mine throughout which such danger exists. Thereupon he shall immediately make an order requiring the operator of such mine to cause all persons, excepting persons referred to in paragraph (2) of this subsection, to be withdrawn from, and to be debarred from entering, such area. Such findings and order shall contain a detailed description of the conditions which such representative finds cause and constitute such danger, and a description of the area of such mine throughout which persons must be withdrawn and debarred. Withdrawal from danger area.

"(2) No order issued under paragraph (1) of this subsection shall require any of the following persons to be withdrawn from, or to be debarred from entering, the area described in the order: (A) Any person whose presence in such area is necessary, in the judgment of the operator of the mine, to eliminate the danger described in the order; (B) any public official whose official duties require him to enter such area; or (C) any legal technical consultant, or any representative of the employees of the mine, who is a certified person qualified to make mine examinations, or is accompanied by such a person, and whose presence in such area is necessary, in the judgment of the operator of the mine, for the proper investigation of the conditions described in the order. Exceptions.

All 66 Stat. 695.

Abatement of violations.

"(b) If such representative of the Bureau finds that any provision of section 209 is being violated and that the conditions created by such violation do not cause danger that a mine explosion, mine fire, mine inundation, or man-trip or man-hoist accident will occur in such mine immediately or before the imminence of such danger can be eliminated, he shall find what would be a reasonable period of time within which such violation should be totally abated. Such findings shall contain the provisions of section 209 which he finds are being violated and a detailed description of the conditions which cause and constitute such violation.

Time limit.

Extension.

"(c) (1) The period of time so found by such representative to be a reasonable period of time may be extended by a duly authorized representative of the Bureau from time to time upon the making of a special inspection to ascertain whether or not such violation has been totally abated. The Director shall promptly cause a special inspection to be made: (A) Upon the expiration of such a period of time as originally fixed; (B) upon the expiration of such a period of time as extended; and (C) whenever an operator of a mine, prior to the expiration of any such period of time, requests him to cause such a special inspection to be made at such mine. Upon making such a special inspection, such representative of the Bureau shall find whether or not such violation has been totally abated. If he finds that such violation has not been totally abated, he shall find whether or not such period of time as originally fixed, or as so fixed and extended, should be extended. If he finds that such period of time should be extended, he shall find what a reasonable extension would be. If he finds that such violation has not been totally abated, and if such period of time as originally fixed, or as so fixed and extended, has then expired, and if he also finds that such period of time should not be further extended, he shall also find the extent of the area of such mine which is affected by such violation. Thereupon he shall promptly make an order requiring the operator of such mine to cause all persons in such area, excepting persons referred to in paragraph (2) of this subsection, to be withdrawn from, and to be debarred from entering, such area. Such finding and order shall contain the provisions of section 209 which are being violated and a detailed description of the conditions which such representative finds cause and constitute such violation, and a description of the area of such mine throughout which persons must be withdrawn and debarred.

Expiration. Debarment from area.

Exceptions.

"(2) No order issued under paragraph (1) of this subsection shall require any of the following persons to be withdrawn from, or to be debarred from entering, the area described in the order: (A) Any person whose presence in such area is necessary, in the judgment of the operator of the mine, to abate the violation described in the order; (B) any public official whose official duties require him to enter such area; or (C) any legal or technical consultant or any representative of the employees of the mine, who is a certified person qualified to make mine examinations, or is accompanied by such a person, and whose presence in such area is necessary, in the judgment of the operator of the mine, for the proper investigation of the conditions described in the order.

Methane.

"(d) If a duly authorized representative of the Bureau, upon making an inspection of a mine, as authorized in section 202, finds that methane has been ignited in such mine or finds methane by use of a permissible flame safety lamp or by air analysis in an amount of 0.25 per centum or more in any open workings of such mine when tested at a point not less than twelve inches from the roof, face, or rib, he shall make an order requiring the operator of such mine to comply with the provisions of section 209 of this title which pertain to gassy mines, in the operation of such mine.

State inspector.

"(e) (1) If an order is made pursuant to subsection (a) of this section with respect to a mine in a State in which a State plan approved under section 202 (b) is in effect, and a State inspector did not participate in the inspection on which such order is based, the operator of the mine may request the agency designated in the State plan to assign a State inspector to inspect the mine. The State inspector assigned in accordance with such request shall inspect such mine promptly after the request is made.

"(2) No order shall be made pursuant to subsection (c) of this section with respect to a mine in a State in which a State plan approved under section 202 (b) is in effect unless a State inspector participated in the inspection on which such order is based and concurs in such order, or an independent inspector appointed under paragraph (3) concurs in such order. If the State inspector does not concur in such order, the operator of the mine, the duly authorized representative of the Bureau who proposes to make such order, or the State inspector may apply, within twenty-four hours after the completion of the inspection involved, for the appointment of an independent inspector under paragraph (3). Within five days after the date of his appointment, the independent inspector shall inspect the mine. The representative of the Bureau and the State inspector shall be given the opportunity to accompany the independent inspector during such inspection. If, after such inspection is completed, either the independent inspector or the State inspector concurs in the order, it shall be issued.

Independent inspector.

"(3) Within five days after the date of receipt of an application under paragraph (2) of this subsection, the chief judge of the United States District Court for the district in which the mine involved is located (or in his absence, the clerk of such court) shall appoint a graduate engineer with experience in the coal-mining industry to serve as an independent inspector under this subsection. Each independent inspector so appointed shall be compensated at the rate of $50 for each day of actual service (including each day he is traveling on official business) and shall, notwithstanding the Travel Expense Act of 1949, be fully reimbursed for traveling, subsistence, and related expenses.

63 Stat. 166. 5 U.S.C. § 835 note.

"(4) An order made pursuant to subsection (a) or (c) of this section with respect to a mine in a State in which a State plan approved under section 202 (b) is in effect shall not be subject to review under section 206, but shall be subject to review under section 207.

Notice of finding and order.

"(f) Notice of each finding and order made under this section shall promptly be given to the operator of the mine to which it pertains, by the person making such finding or order.

"NOTICES

Signatures, etc.

"SEC. 204. (a) All findings and orders made pursuant to section 203 or section 206, and all notices required to be given of the making of such findings and orders, shall be in writing. All such findings and orders shall be signed by the person making them, and all such notices shall be signed by the person charged with the duty of giving the notice. All such notices shall contain a copy of the findings and orders referred to therein.

Bulletin board.

"(b) Each operator of a mine shall maintain an office on or near the premises of such mine and shall maintain thereon a conspicuous sign designating it as the office of such mine. Each operator of a mine shall maintain a bulletin board at such office or at some conspicuous place near an entrance of such mine, in such manner that notices required by law to be posted on the mine bulletin board may be posted

All 66 Stat. 697.

thereon, be easily visible to all persons desiring to read them, and be protected against damage by weather and against unauthorized removal. The operator shall maintain on such bulletin board a conspicuous sign designating it as the bulletin board of such mine. Notice of any finding or order required by section 203 or section 206 to be given to an operator shall be given by causing such notice, addressed to the operator of the mine to which it pertains, to be delivered to the office of such mine provided for in the first sentence of this subsection, and by causing a copy of such notice to be posted on the bulletin board of such mine provided for in the second sentence of this subsection. The requirement of the preceding sentence that a notice shall be 'addressed to the operator of the mine to which it pertains', shall not require that the name of the operator for whom it is intended shall be specifically set out in such address. Addressing such notice to 'Operator of Mine', specifying the mine sufficiently to identify it, shall satisfy such requirement.

Distribution of notice.

"(c) The Director shall cause a copy of each such notice to be mailed immediately to a duly designated representative of the employees of the mine to which it pertains, and to the public official or agency of the State or Territory charged with administering State or Territorial laws, if any, relating to mine safety in such mine.

"CREATION OF REVIEW BOARD

Federal Coal Mine Safety Board of Review.

"SEC. 205. (a) An agency is hereby created to be known as the Federal Coal Mine Safety Board of Review, which shall be composed of three members who shall be appointed by the President, by and with the advice and consent of the Senate.

Terms of office.

"(b) The terms of office of members of the Board shall be three years, except that the terms of office of the members first appointed shall commence on the effective date of this section and shall expire one at the end of one year, one at the end of two years, and one at the end of three years, as designated by the President at the time of appointment. A member appointed to fill a vacancy caused by the death, resignation, or removal of a member prior to the expiration of the term for which he was appointed, shall be appointed only for the remainder of such unexpired term. The members of the Board may be removed by the President for inefficiency, neglect of duty, or malfeasance in office.

Compensation.

63 Stat. 166. 5 U.S.C. § 835 note.

"(c) Each member of the Board shall be compensated at the rate of $50 for each day of actual service (including each day he is traveling on official business) and shall, notwithstanding the Travel Expense Act of 1949 be fully reimbursed for traveling, subsistence, and other related expenses. The Board, at all times, shall consist of one person who by reason of previous training and experience may reasonably be said to represent the viewpoint of coal-mine operators, one person who by reason of previous training and experience may reasonably be said to represent the viewpoint of coal-mine workers, and one person, who shall be chairman of the Board, who shall be a graduate engineer with experience in the coal-mining industry or shall have had at least five years' experience as a practical mining engineer in the coal-mining industry, and who shall not, within one year of his appointment as a member of the Board, have had a pecuniary interest in, or have been regularly employed or engaged in, the mining of coal, or have regularly represented either coal-mine operators or coal-mine workers, or have been an officer or employee of the Department of the Interior assigned to duty in the Bureau.

Principal office.

"(d) The principal office of the Board shall be in the District of Columbia. Whenever the Board deems that the convenience of the

public or of the parties may be promoted, or delay or expense may be minimized, it may hold hearings or conduct other proceedings at any other place. The Board shall have an official seal which shall be judicially noticed and which shall be preserved in the custody of the secretary of the Board.

Appointment of employees.

"(e) The Board shall, without regard to the civil service laws, appoint and prescribe the duties of a secretary of the Board and such legal counsel as it deems necessary. Subject to the civil-service laws, the Board shall appoint such other employees as it deems necessary in exercising its powers and duties. The compensation of all employees appointed by the Board shall be fixed in accordance with the Classification Act of 1949, as amended.

63 Stat. 954. 5 U.S.C. § 1071 note.

Quorum.

"(f) Two members of the Board shall constitute a quorum, and official actions of the Board can be taken only on the affirmative vote of at least two members; but any one member, or any two members, upon order of the Board, shall conduct any hearing provided for in section 207 and submit the transcript of such hearing to the entire Board for its action thereon. Every official act of the Board shall be entered of record, and its hearings and records thereof shall be open to the public.

Hearings and determinations.

"(g) The Board shall hear and determine applications filed pursuant to section 207 for annulment or revision of orders made pursuant to section 203 or section 206. The Board shall not make or cause to be made any inspection of a mine for the purpose of determining any pending application.

Rules.

"(h) The Board is authorized to make such rules as are necessary for the orderly transaction of its proceedings, which shall include requirement for adequate notice of hearings to all parties.

Subpenas.

"(i) Any member of the Board may sign and issue subpenas for the attendance and testimony of witnesses and the production of relevant papers, books and documents, and administer oaths. Witnesses summoned before the Board shall be paid the same fees and mileage that are paid witnesses in the courts of the United States.

Depositions.

"(j) The Board may order testimony to be taken by deposition in any proceeding pending before it, at any stage of such proceeding. Reasonable notice must first be given in writing by the party or his attorney proposing to take such deposition to the opposite party or his attorney of record, which notice shall state the name of the witness and the time and place of the taking of his deposition. Any person may be compelled to appear and depose, and to produce books, papers, or documents, in the same manner as witnesses may be compelled to appear and testify and produce like documentary evidence before the Board, as provided in subsection (i). Witnesses whose depositions are taken under this subsection, and the persons taking such depositions shall be entitled to the same fees as are paid for like services in the courts of the United States.

Contumacy, etc.

"(k) In case of contumacy by, or refusal to obey a subpena served upon, any person under this section, the Federal district court for any district in which such person is found or resides or transacts business, upon application by the United States, and after notice to such person and hearing, shall have jurisdiction to issue an order requiring such person to appear and give testimony before the Board or to appear and produce documents before the Board, or both; and any failure to obey such order of the court may be punished by such court as a contempt thereof.

All 66 Stat. 699.

"REVIEW BY DIRECTOR

Application for annulment or revision of order.

"SEC. 206. (a) Except as provided in section 203 (e) (4), an operator notified of an order made pursuant to section 203 (a) may apply to the Director for annulment or revision of such order. Upon receipt of such application the Director shall make a special inspection of the mine affected by such order, or cause three duly authorized representatives of the Bureau, other than the representative who made such order, to make such inspection of such mine and to report thereon to him. Upon making such special inspection himself, or upon receiving the report of such inspection made by such representatives, the Director shall find whether or not danger throughout the area of such mine as set out in such order existed at the time of making such special inspection. If he finds that such danger did not then exist throughout such area of such mine, he shall make an order, consistent with his findings, revising or annulling the order under review. If he finds that such danger did then exist throughout such area of such mine, he shall make an order denying such application.

"(b) Except as provided in section 203 (e) (4), an operator notified of an order made pursuant to section 203 (c) may apply to the Director for annulment or revision of such order. Upon receipt of such application the Director shall make a special inspection of the mine affected by such order, or cause three duly authorized representatives of the Bureau, other than the representative who made such order, to make such inspection of such mine and report thereon to him. Upon making such special inspection himself, or upon receiving the report of such inspection made by such representatives, the Director shall find whether or not there was a violation of section 209 as described in such order, at the time of the making of such order. If he finds there was no such violation he shall make an order annulling the order under review. If he finds there was such a violation he shall also find whether or not such violation was totally abated at the time of the making of such special inspection. If he finds that such violation was totally abated at such time, he shall make an order annulling the order under review. If he finds that such violation was not totally abated at such time, he shall find whether or not the period of time within which such violation should be totally abated, fixed under section 203, should be extended. If he finds that such period of time should be extended, he shall find what a reasonable extension of such period of time would be. Thereupon he shall find the extent of the area of such mine which was affected by such violation at the time such special inspection was made, and then he shall make an order, consistent with his findings, revising the order under review. If he finds that such violation was not totally abated at the time of such special inspection, and that such period of time should not be extended, he shall find the extent of the area of such mine which was affected by such violation at the time such special inspection was made, and he shall then make an order, consistent with his findings, affirming or revising the order under review.

"(c) An operator notified of an order made pursuant to section 203 (d) may apply, not later than twenty days after the receipt of notice of such order, to the Director for annulment of such order. Upon receipt of such application the Director shall make or cause to be made such investigation as he deems necessary. Upon concluding his investigation or upon receiving the report of such investigation made at his direction, the Director shall find whether or not methane has been ignited in such mine, or whether or not methane was found in such mine in an amount of 0.25 per centum or more in any open workings of such mine, when tested at a point not less than twelve inches from the roof, face, or rib, at the time of the making of such order.

If he finds that methane has not been ignited in such mine and was not found in such mine as set out in such order, he shall make an order annulling the order under review. If he finds that methane has been ignited in such mine or was found in such mine as set out in the order under review, he shall make an order denying such application.

"(d) The Director shall cause notice of each finding and order made under this section to be given promptly to the operator of the mine to which it pertains.

"(e) Except as provided in section 202 (e) (4), at any time while an order made pursuant to section 203 or this section is in effect, or at any time during the pendency of a proceeding under section 207 or section 208 seeking annulment or revision of such order, the operator of the mine affected by such order may apply to the Director for annulment or revision of such order. The Director shall thereupon proceed to act upon such application in the manner provided in subsections (a), (b), or (c) of this section.

"(f) In view of the urgent need for prompt decision of matters submitted to the Director under this section, all actions which the Director or his representatives are required to take under this section shall be taken as rapidly as practicable, consistent with adequate consideration of the issues involved.

"REVIEW BY BOARD

"SEC. 207. (a) An operator notified of an order made pursuant to subsection (a), (c), or (d) of section 203 may apply to the Federal Coal Mine Safety Board of Review for annulment or revision of such order without seeking its annulment or revision under section 206. An operator notified of an order made pursuant to section 206 may apply to the Board for annulment or revision of such order: *Provided, however*, That an operator applying to the Board for annulment of an order made pursuant to subsection (d) of section 203 or pursuant to subsection (c) of section 206 shall file such application with the Board not later than twenty days after the receipt of notice of such order.

Application for annulment or revision of order.

"(b) The operator shall be designated as the applicant in such proceeding and the application filed by him shall recite the order complained of and other facts sufficient to advise the Board of the nature of the proceeding. He may allege in such application: That danger as set out in such order does not exist at the time of the filing of such application; that violation of section 209, as set out in such order, has not occurred; that such violation has been totally or partially abated; that the period of time within which such violation should be totally abated, as fixed in the findings upon which such order was based, was not reasonable; that the area of the mine described in such order as the area affected by the violation referred to in such order is not so affected at the time of the filing of such application; or that the mine described in such order is not a gassy mine. The Director shall be the respondent in such proceeding, and the applicant shall send a copy of such application by registered mail to the Director at Washington, District of Columbia.

"(c) Immediately upon the filing of such an application the Board shall fix the time for a prompt hearing thereof.

Hearing.

"(d) Pending such hearing the applicant may file with the Board a written request that the Board grant such temporary relief from such order as the Board may deem just and proper. Such temporary relief may be granted by the Board only after a hearing by the Board at which both the applicant and the respondent were afforded an opportunity to be heard, and only if respondent was given ample notice of

Request for temporary relief.

All 66 Stat. 701.

the filing of applicant's request and of the time and place of the hearing thereon as fixed by the Board.

Evidence.

"(e) The Board shall not be bound by any previous findings of fact by the respondent or by any other representative of the Bureau. Evidence relating to the making of the order complained of and relating to the questions raised by the allegations of the pleadings or other questions pertinent in the proceeding may be offered by both parties to the proceeding. If the respondent claims that danger or a violation of section 209, as set out in such order, existed at the time of the filing of the application, or that methane has been ignited or found in such mine as set out in the order under review, the burden of proving the then existence of such danger or violation, or that methane has been ignited or found in such mine as set out in the order under review, shall be upon the respondent, and the respondent shall present his evidence first to prove the then existence of such danger or violation. Following presentation of respondent's evidence the applicant may present his evidence, and thereupon respondent may present evidence to rebut the applicant's evidence.

Findings of Board.

"(f) If the proceeding is one in which an operator seeks annulment or revision of an order made pursuant to section 203 (a), the Board, upon conclusion of the hearing, shall find whether or not danger throughout the area of such mine as set out in such order existed at the time of the filing of the operator's application. If the Board finds that such danger did not then exist throughout such area of such mine, the Board shall make an order, consistent with its findings, revising or annulling the order under review. If the Board finds that such danger did then exist throughout such area of such mine, the Board shall make an order denying such application.

"(g) If the proceeding is one in which an operator seeks annulment or revision of an order made pursuant to section 203 (c), the Board, upon conclusion of the hearing, shall find whether or not there was a violation of section 209 as described in such order, at the time of the making of such order. If the Board finds there was no such violation, the Board shall make an order annulling the order under review. If the Board finds there was such a violation, the Board shall also find whether or not such violation was totally abated at the time of the filing of the operator's application. If the Board finds that such violation was totally abated at such time, the Board shall make an order annulling the order under review. If the Board finds that such violation was not totally abated at such time, the Board shall find whether or not the period of time within which such violation should be totally abated, fixed under section 203 or 206, should be extended. If the Board finds that such period of time should be extended, the Board shall also find what a reasonable extension of such period of time would be, and shall immediately also find the extent of the area of such mine which was affected by such violation at the time of the filing of such application and the Board shall then make an order, consistent with its findings, revising the order under review. If the Board finds that such violation was not totally abated at the time of the filing of the operator's application, and that such period of time should not be extended, the Board shall find the extent of the area of such mine which was affected by such violation at such time, and shall make an order, consistent with its findings, affirming or revising the order under review.

"(h) If the proceeding is one in which an operator seeks annulment of an order made pursuant to section 203 (d) or 206 (c), the Board, upon conclusion of the hearing, shall find whether or not methane has been ignited in such mine or was found in such mine in an amount of 0.25 per centum or more in any open workings of such mine when

tested at a point not less than twelve inches from the roof, face, or rib, as set out in such order. If the Board finds that methane has not been ignited in such mine and was not found in such mine as set out in such order, the Board shall make an order annulling the order under review. If the Board finds that methane has been ignited in such mine or was found in such mine as set out in the order under review, the Board shall make an order denying such application.

"(i) Each finding and order made by the Board shall be in writing. It shall show the date on which it is made, and shall bear the signatures of the members of the Board who concur therein. Upon making a finding and order the Board shall cause a true copy thereof to be sent by registered mail to all parties or their attorneys of record. The Board shall cause each such finding and order to be entered on its official record, together with any written opinion prepared by any member in support of, or dissenting from, any such finding or order.

"(j) In view of the urgent need for prompt decision of matters submitted to the Board under this section, all actions which the Board is required to take under this section shall be taken as rapidly as practicable, consistent with adequate consideration of the issues involved.

"JUDICIAL REVIEW

"SEC. 208. (a) Any final order issued by the Board under section 207 shall be subject to judicial review by the United States Court of Appeals for the circuit in which the mine affected is located, upon the filing in such court of a notice of appeal by the Director or the operator aggrieved by such final order within thirty days from the date of the making of such final order. Notice of appeal.

"(b) The party making such appeal shall forthwith send a copy of such notice of appeal, by registered mail, to the other party and to the Board. Upon receipt of such copy of a notice of appeal the Board shall promptly certify and file in such court a complete transcript of the record upon which the order complained of was made. The costs of such transcript shall be paid by the party making the appeal. Copies; transcript.

"(c) The court shall hear such appeal on the record made before the Board, and shall permit argument, oral or written or both, by both parties. The court shall permit such pleadings, in addition to the pleadings before the Board, as it deems to be required or as provided for in the Rules of Civil Procedure governing appeals in such court. Argument, etc.

"(d) Upon such conditions as may be required and to the extent necessary to prevent irreparable injury, the United States Court of Appeals may, after due notice to and hearing of the parties to the appeal, issue all necessary and appropriate process to postpone the effective date of the final order of the Board or to grant such other relief as may be appropriate pending final determination of the appeal. Postponement.

"(e) The United States Court of Appeals may affirm, annul, or revise the final order of the Board, or it may remand the proceeding to the Board for such further action as it directs. The findings of the Board as to facts, if supported by substantial evidence on the record considered as a whole, shall be conclusive. Action by court.

"(f) The decision of a United States Court of Appeals on an appeal from the Board shall be final, subject only to review by the Supreme Court as provided in section 1254 of title 28 of the United States Code. 62 Stat. 928.

[111 66 Stat. 703.]

"MINE SAFETY PROVISIONS

"SEC. 209. (a) DUTY TO COMPLY.—Every operator of a mine, and every person who is on the premises of a mine for any reason whatsoever, shall comply with the provisions of this section, except those provisions which impose no duty, obligation or responsibility upon such operator or such person.

"(b) Every operator of a mine which, on or after the effective date of this title, is, or which, immediately prior to the effective date of this title, was, defined, classed, classified as, or determined, deemed, judged, held, or found to be, a gassy or gaseous mine pursuant to and in accordance with the laws of the State in which it is located, and every operator of a mine which, immediately prior to the effective date of this title, was operated as a gassy mine, shall comply with the provisions of this section which pertain to gassy mines.

"(c) ROOF SUPPORT.—The roof and ribs of all active underground roadways and travelways in a mine shall be adequately supported to protect persons from falls of roof or ribs.

"(d) VENTILATION.—(1) All active underground working places in a mine shall be ventilated by a current of air containing not less than 19.5 per centum of oxygen, not more than 0.5 per centum of carbon dioxide, and no harmful quantities of other noxious or poisonous gases. The volume and velocity of the current of air shall be sufficient to dilute so as to render harmless, and to carry away, flammable or harmful gases. In bituminous-coal and lignite mines the quantity of air reaching the last open crosscut in any pair or set of entries shall not be less than six thousand cubic feet a minute, except that the quantity of air reaching the last open crosscut in any pair or set of entries in pillar sections may be less than six thousand cubic feet a minute if not less than six thousand cubic feet of air a minute is being delivered to the intake end of the pillar line. In anthracite mines the quantity of air reaching the face of each working place shall be at least two hundred cubic feet a minute for each man working in the place and as much more as may be required to dilute, render harmless, and sweep away noxious or dangerous gases, smoke, and fumes. In robbing areas where the air currents cannot be controlled and measurements of the air cannot be obtained, the air shall have perceptible movement.

"(2) If the air at an underground working face in a mine, when tested at a point not less than twelve inches from the roof, face, or rib, contains more than 1.0 per centum of methane, as determined by a permissible methane detector, a permissible flame safety lamp, air analysis, or other recognized means of accurately detecting such gas, changes or adjustments shall be made at once in the ventilation in such mine so that such air shall not contain more than 1.0 per centum of methane.

"(3) If a split of air returning from active underground working places in a mine contains more than 1.0 per centum of methane, as determined by a permissible methane detector, a permissible flame safety lamp, air analysis, or other recognized means of accurately detecting such gas, changes or adjustments shall be made at once in the ventilation in such mine so that such returning air shall not contain more than 1.0 per centum of methane.

"(4) If a split of air returning from active underground working places in a mine contains 1.5 per centum of methane, as determined by a permissible methane detector, a permissible flame safety lamp, air analysis, or other recognized means of accurately detecting such gas, the employees shall be withdrawn from the portion of the mine endangered thereby, and all power shall be cut off from such portion of the mine, until the quantity of methane in such split shall be less than

1.5 per centum. However, in virgin territory in mines ventilated by exhaust fans, where methane is liberated in large amounts, if the quality of air in a split ventilating the workings in such territory equals or exceeds twice the minimum volume of air prescribed in paragraph (1) of this subsection and if only permissible electric equipment is used in such workings and the air in the split returning from such workings does not pass over trolley or other bare power wires, and if a certified person designated by the mine operator is continually testing the gas content of the air in such split during mining operations in such workings, it shall be necessary to withdraw the employees and cut off all power from the portion of the mine endangered by such methane only when the quantity thereof in the air returning from such workings exceeds 2 per centum, as determined by a permissible methane detector, a permissible flame safety lamp, air analysis, or other recognized means of accurately detecting such gas.

"(5) In a gassy mine, air which has passed by an opening of any unsealed, abandoned area shall not be used to ventilate any active face area in such mine if such air contains 0.25 per centum or more of methane; but if this sentence cannot be complied with in such mine on the effective date of this section, such mine may continue to be operated after such date as it was operated immediately prior to such date, for a reasonable time until future mine development and ventilation of such mine can be changed to comply with this sentence. In no event shall such air be used to ventilate any area in such mine in which men work or travel if such air contains more than 1 per centum of methane. For the purposes of this paragraph, an area within a panel shall not be deemed to be abandoned until such panel is abandoned.

"(6) In a gassy mine, air that has passed through an abandoned panel which is inaccessible for inspection, or air that has passed through a similar abandoned area which is inaccessible for inspection, or air which has been used to ventilate a pillar line, or air which has been used to ventilate an area from which the pillars have been removed, shall not be used to ventilate any active face area in such mine; but if this sentence cannot be complied with in such mine on the effective date of this section, such mine may continue to be operated after such date as it was operated immediately prior to such date, for a reasonable time until future mine development and ventilation of such mine can be changed to comply with this sentence. In no event shall such air be used to ventilate any area in such mine in which men work or travel if such air contains more than 1 per centum of methane.

"(7) In a gassy mine, within four hours immediately preceding the beginning of a coal-producing shift, and before any workmen in such shift other than those who may be designated to make the examinations prescribed in this paragraph enter the underground areas of such mine, certified persons designated by the operator of such mine to do so shall make an examination, as prescribed in this paragraph, of such areas. Each person designated to act as such a mine examiner shall be directed to examine a definite underground area of such mine, and, in making his examination, such examiner shall inspect every active working place in such area and make tests therein with a permissible flame safety lamp for accumulations of methane and oxygen deficiency in the air therein; examine seals and doors to determine whether they are functioning properly; inspect and test the roof, face, and rib conditions in the working places and on active roadways and travel ways; inspect active roadways, travel ways, approaches to abandoned workings and accessible falls in active sections for explosive gas and other hazards; and inspect to determine whether the air in each split is traveling in its proper course and in normal volume. Such mine examiner shall place his initials and the date at or near the face of each

"Danger" sign.

place he examines. If such mine examiner, in making his examination, finds a condition which he considers to be dangerous to persons who may enter or be in such area, he shall indicate such dangerous place by posting a 'DANGER' sign conspicuously at a point which persons entering such dangerous place would be required to pass. No person, other than Federal or State mine inspectors or persons authorized by the mine operator to enter such place for the purpose of eliminating the dangerous condition therein, shall enter such place while such sign is so posted. Upon completing his examination such mine examiner shall report the result of his examination to a person designated by the mine operator to receive such reports, at a designated station on the surface of the premises of the mine or underground, before other persons enter the underground areas of such mine to work in such coal-producing shift. Each such mine examiner shall also record the results of his examination with ink or indelible pencil in a book kept for such purpose at a place on the surface of the mine designated by the mine operator. No person (other than a certified person designated under this paragraph) shall enter any underground area in a gassy mine, except during a coal-producing shift, unless an examination of such area as prescribed in this paragraph has been made within twelve hours immediately preceding his entrance into such area.

"(8) In nongassy mines, an examination as prescribed in paragraph (7) shall be made at least once in each calendar day during which coal is produced. Such examination shall be made within four hours immediately preceding the beginning of the first coal-producing shift on such day.

"(9) The underground working places in all mines shall be examined for hazards by certified persons designated by the mine operator to do so, at least once during each coal-producing shift, or oftener if necessary for safety. In a gassy mine, such examinations shall include tests with a permissible flame safety lamp for methane, and oxygen deficiency. In all underground face workings in a gassy mine where electrically driven equipment is operated, examinations for methane shall be made with a permissible flame safety lamp by a person trained in the use of such lamp before such equipment is taken into or operated in face regions, and frequent examinations for methane shall be made during such operations.

"(10) In a gassy mine, immediately before a roof fall is made in pillar workings, such workings shall be examined to ascertain whether methane is present. If in such examination methane is found in amounts that can be detected with a permissible flame safety lamp, a roof fall shall not be made until such gas is removed.

"(11) In a gassy mine, all workings which are abandoned after the effective date of this section or the date such mine became a gassy mine, whichever is later, shall be sealed or ventilated. If such workings are sealed, the sealing shall be done in a substantial manner with incombustible material. One or more of the seals of every sealed area shall be fitted with a pipe and cap or valve to permit the sampling of gases and the measuring of hydrostatic pressure behind such seals. For the purposes of this paragraph, workings within a panel shall not be deemed to be abandoned until such panel is abandoned.

"(e) COAL DUST AND ROCK DUST.—(1) Coal dust, loose coal, and other combustible materials shall not be permitted to accumulate in dangerous quantities in active underground workings of a mine.

"(2) Where underground mining operations raise an excessive amount of dust into the air, water, or water with a wetting agent added to it, or other effective method shall be used to allay such dust at its source.

"(3) All underground mines, except those mines or areas of mines in which the dust is too wet or too high in incombustible content to propagate an explosion, shall be rock-dusted to within forty feet of all faces, and, if open crosscuts near such faces are less than forty feet therefrom, such crosscuts shall be rock-dusted.

"(4) In mines partially rock-dusted or in mines that are required to start rock-dusting, haulageways and parallel entries connected thereto by open crosscuts shall be rock-dusted. Back entries shall be rock-dusted for at least one thousand feet outby the junction with the first active entry. Inby this junction, the rooms, entries, and crosscuts shall be rock-dusted.

"(5) Where rock dust is applied, it shall be distributed upon the top, floor, and sides of all open places and maintained in such quantity that the incombustible content of the combined coal dust, rock dust and other dust will not be less than 65 per centum. Where methane is present in any ventilating current, the 65 per centum of incombustible content of such combined dust shall be increased 1 per centum for each 0.1 per centum of methane.

"(6) Paragraphs (2), (3), (4), and (5) of this subsection shall not apply to anthracite mines.

"(f) ELECTRICAL EQUIPMENT.—(1) All electric face equipment used in a gassy mine shall be permissible, except that electric face equipment may be used in a gassy mine even though such equipment is not permissible if, before the effective date of this section or the date such mine became a gassy mine, whichever is later, the operator of such mine owned such equipment, or owned the right to use such equipment, or had ordered such equipment. Permissible electric face equipment in use in a gassy mine shall not be replaced by electric face equipment which is not permissible except that (A) permissible and nonpermissible electric face equipment in use in a mine may be interchanged within such mine, and (B) explosion-tested cable-reel locomotives and shuttle cars purchased before permissible cable-reel locomotives and shuttle cars became available, may be used to replace permissible cable-reel locomotives and shuttle cars. Face equipment.

"(2) In a gassy mine, permissible junction or distribution boxes shall be used for making multiple-power connections in working places or other places where dangerous quantities of methane may be present or may enter the air current, except that where nonpermissible junction or distribution boxes are in use, or on order, on the effective date of this section or the date such mine became a gassy mine, whichever is later, their use may be continued until such time as replacements are made. Junction or distribution boxes.

"(3) In a gassy mine, explosion-tested cable-reel locomotives shall be equipped with two-conductor trailing cables. Two-conductor trailing cables.

"(4) In a gassy mine, trolley and feeder wires shall not extend beyond the last open crosscut and shall be kept at least one hundred and fifty feet from pillar workings. Trolley and feeder wires.

"(g) FIRE PROTECTION.—(1) Each mine shall be provided with suitable fire-fighting equipment, adequate for the size of the mine.

"(2) After every blasting operation performed on shift, an examination shall be made to determine whether fires have been started.

"(3) Underground storage places for lubricating oil and grease in excess of two days' supply shall be of fireproof construction.

"(4) Lubricating oil and grease kept in face regions or other underground working places in a mine shall be in portable, closed, metal containers.

"(5) Underground structures (transformer stations, battery-charging stations, substations, permanent pump rooms, etc.), installed in a mine after the effective date of this section shall be of fireproof construction.

"(6) Welding, cutting, or soldering with arc or flame in underground face regions in other than a fireproof enclosure shall be done under the direct supervision of a certified person who shall test for methane before and during such operations in gassy mines and shall make a diligent search for fire after such operations in all mines. Rock dust or suitable fire extinguishers shall be immediately available during such welding, cutting, or soldering.

"(h) MISCELLANEOUS.—(1) The drilling and sealing of oil and gas wells penetrating coal beds or underground workings of mines shall be done in compliance with State statutes.

"(2) Whenever any working place in an underground mine approaches within fifty feet of abandoned workings in such mine as shown by surveys made and certified by a competent engineer or surveyor, or within two hundred feet of any other abandoned workings of such mine, which cannot be inspected and which may contain dangerous accumulations of water or gas, or within two hundred feet of any workings of an adjacent mine, a borehole or boreholes shall be drilled to a distance of at least twenty feet in advance of the face of such working place. Such boreholes shall be drilled sufficiently close to each other to insure that the advancing face will not accidentally hole through into such workings. Boreholes shall also be drilled not more than eight feet apart in the rib of such working place to a distance of at least twenty feet and at an angle of forty-five degrees. Such rib holes shall be drilled in one or both ribs of such working place as may be necessary for adequate protection of persons working in such place.

"(3) In a gassy mine, smoking shall not be permitted underground, nor shall any person be permitted to carry smoking materials, matches, or lighters underground.

"(4) In a gassy mine, persons underground shall use only permissible electric lamps for portable illumination.

"(5) Black blasting powder shall not be stored, handled or used underground in a mine; but for a period of six months after the effective date of this section, this paragraph shall not apply to any mine in which the storage, handling, or use of such powder is expressly permitted by a statute of the State in which such mine is located.

"(6) Mudcaps (adobes) or other unconfined shots shall not be fired underground in a mine. However, in anthracite mines mudcaps or other open, unconfined shots may be fired, if restricted to battery starting when no gas or fire hazard is present, and if it is otherwise impracticable to start the battery; likewise, in anthracite mines open, unconfined 'shake' shots in working places and other places in pitching veins may be fired, when no gas or fire hazard is present, if the taking down of loose, hanging coal by other means is too hazardous for men working in such places. Only permissible explosives shall be used for such open, unconfined shots in anthracite mines.

"(7) Every hoist used to transport persons at a mine, other than hoists used in excavating shafts or slopes, shall be equipped with overspeed, overwind, and automatic stop controls unless a second engineer is on duty. Every hoist used to transport such persons shall be equipped with brakes capable of stopping the platform, cage, or other device for transporting persons when fully loaded; and with hoisting cable adequately strong to sustain the fully loaded platform, cage, or other device for transporting persons, and have a proper margin of safety. Cages or platforms which are used to transport persons in vertical shafts, except cages or platforms which are also used to transport coal, shall be equipped with safety catches that act quickly and effectively in an emergency, and the safety catches shall be tested at least once every two months. Every hoist that is used

to transport persons at a mine shall be inspected daily. No engineer shall be required for automatically operated cages or platforms.

"PENALTIES

"SEC. 210. (a) Any operator of a mine notified of an order made pursuant to section 203 or section 206, requiring him to cause persons to be withdrawn from, and to be debarred from entering, any area of such mine, who willfully fails to comply with such order shall be fined not more than $2,000.

"(b) Any agent of an operator of a mine, knowing of the making of an order requiring such operator to cause persons to be withdrawn from, and to be debarred from entering, any area of such mine, who willfully directs, authorizes or causes any person, other than one who is lawfully authorized to enter or be in such area to enter or be in such area while such order is in effect, shall be fined not more than $2,000.

"(c) Any person, knowing of the making of an order requiring an operator of a mine to cause persons to be withdrawn from, and to be debarred from entering, any area of such mine, who enters such area or remains therein while such order is in effect, shall, unless he is a person who is lawfully authorized to enter or be in such area, be fined not more than $2,000.

"(d) Any owner, lessee, agent, manager, superintendent, or other person having control or supervision of any coal mine subject to section 202 who refuses to admit the Director, any duly authorized representative of the Bureau, any State inspector assigned in accordance with a State plan, or any independent inspector appointed under section 203 (e) (3) to such mine, pursuant to section 202 (c), shall be fined not more than $500.

"EFFECT ON STATE LAWS

"SEC. 211. (a) No State or Territorial law in effect upon the effective date of this title or which may become effective thereafter, shall be superseded by any provision of this title, except insofar as such State or Territorial law is in conflict with this title, or with orders issued pursuant to this title.

"(b) Provisions in any State or Territorial law in effect upon the effective date of this title, or which may become effective thereafter, which provide for greater safety of persons on coal-mine premises, in connection with a particular phase of coal-mining operations, than do provisions of this title, which relate to the same phase of such operations, shall not be construed or held to be in conflict with this title. Provisions in any State or Territorial law in effect upon the effective date of this title, or which may become effective thereafter, which provide for the safety of persons on coal-mine premises in connection with phases of coal-mining operations concerning which no provision is contained in this title, shall not be construed or held to be superseded by this title.

"(c) Nothing in this title shall be construed or held to supersede or in any manner affect the workmen's compensation laws of any State or Territory, or to enlarge or diminish or affect in any other manner the common law or statutory rights, duties or liabilities of employers and employees under State or Territorial laws in respect of injuries, occupational or other diseases or death of employees arising out of or in the course of employment.

All 66 Stat. 709.

"ADMINISTRATIVE PROVISIONS

Certificate of conformance.

"SEC. 212. (a) Whenever the Director determines that the construction of any equipment conforms to specifications prescribed by the Director which are designed to assure that such equipment will not cause a mine explosion or mine fire, he shall issue a certificate to the manufacturer of such equipment (1) stating that such equipment has met such specifications, (2) authorizing such manufacturer to attach an approval plate, label, or other device approved by the Director which indicates that such equipment conforms to such specifications, and (3) authorizing such manufacturer to attach an identical approval plate, label, or other device to all identical equipment.

Appointment of employees; salaries.
63 Stat. 954.
5 U.S.C. §1071 note.

"(b) The Secretary of the Interior shall have authority to appoint, subject to the civil-service laws, such officers and employees as he may deem requisite for the administration of this title; and to fix, subject to the Classification Act of 1949, as amended, the compensation of officers and employees so appointed. No person shall be assigned or appointed to perform the duties of a duly authorized representative of the Bureau unless he has the basic qualifications of at least five years' practical experience in the mining of coal and is recognized by the Bureau as having the training or experience of a practical mining engineer in those essentials necessary for competent coal mine inspection.

Report to Congress.

"(c) The Director shall submit annually to the Congress, as soon as practicable after the beginning of each regular session, a full report of the administration of his functions under this title during the preceding calendar year. Such report shall include, either in summary or detailed form, the information obtained by him under this title, together with such findings and comments thereon and such recommendations for legislative action as he may deem proper.

"EXCLUSION FROM ADMINISTRATIVE PROCEDURE ACT

60 Stat. 237.
5 U.S.C. § 1001 note.

"SEC. 213. The Administrative Procedure Act shall not apply to the making of any order pursuant to this title, or to any proceeding for the annulment or revision of any such order.

"AUTHORIZATION OF APPROPRIATIONS

"SEC. 214. There are hereby authorized to be appropriated such sums, not exceeding $3,000,000 in any fiscal year, as may be necessary for the due execution of this title.

"SEVERABILITY

"SEC. 215. If any provision of this title, or the application thereof to any person or circumstance, is held invalid, the remainder of this title, and the application of such provision to other persons or circumstances, shall not be affected thereby."

55 Stat. 178.
30 U.S.C. § 41.

SEC. 2. Section 4 of the Act entitled "An Act relating to certain inspections and investigations in coal mines for the purpose of obtaining information relating to health and safety conditions, accidents, and occupational diseases therein, and for other purposes", approved May 7, 1941, is amended by striking out "or by imprisonment not exceeding sixty days, or by both".

30 U.S.C. § 43.

SEC. 3. Section 5 of the Act entitled "An Act relating to certain inspections and investigations in coal mines for the purpose of obtaining information relating to health and safety conditions, accidents, and occupational diseases therein, and for other purposes", approved May 7, 1941, is amended—

All 66 Stat. 710.

(1) By striking out "during the calendar year in which the request is made or during the preceding calendar year" and inserting in lieu thereof "during the six-month period immediately preceding the date on which the request is made".

(2) By adding at the end of such section the following new sentence: "Whoever willfully violates this section shall be fined not more than $500."

SEC. 4. The Act entitled "An Act relating to certain inspections and investigations in coal mines for the purpose of obtaining information relating to health and safety conditions, accidents, and occupational diseases therein, and for other purposes", approved May 7, 1941, is amended— 55 Stat. 177. 30 U.S.C. §§ 4f-4o.

(1) By inserting immediately after the comma at the end of the enacting clause the following: "That this Act may be cited as the 'Federal Coal Mine Safety Act'.". Short title.

(2) By inserting immediately below the matter inserted by paragraph (1) the following:

"TITLE I—ADVISORY POWERS RELATING TO HEALTH AND SAFETY CONDITIONS IN MINES"

(3) By striking out "this Act", wherever appearing therein, and inserting in lieu thereof "this title".

(4) By striking out "That the" at the beginning of the present first section and inserting in lieu thereof "SEC. 101. The" 30 U.S.C. § 4f.

(5) By redesignating the presently designated sections 2 to 12, inclusive, as sections 102 to 112, respectively. 30 U.S.C. §§ 4g-4o, 4f note.

(6) By striking out "section 1" in the presently designated section 2 and inserting in lieu thereof "section 101"

(7) By striking out "section 1 or section 2" in the presently designated sections 3 and 4, and inserting in lieu thereof "section 101 or section 102".

(8) By striking out "section 3" in the presently designated section 4 and inserting in lieu thereof "section 103".

(9) By striking out "section 6" in the presently designated section 7 and inserting in lieu thereof "section 106".

Approved July 16, 1952.

I would like to quote from the proceedings of the U.N. Conference on Peaceful Uses of Atomic Energy held in Geneva, 1955, and a paper presented by Dr. George G. Manov, whom I believe is known to the committee, and a man who was administrative assistant, I believe, to either the Chairman or one of the Commissioners.

Mr. RAMEY. To Commissioner Libby.

Mr. GOODMAN. He presented a paper entitled "Administrative Problems in the Industrial Utilization of Atomic Energy," and on page 36 there is a section entitled "The Cost of Routine Radiological Safety Protection." You recall that I raised this subject because earlier when the question had been raised as to whether or not protection standards should be set on an individual basis, rather than averaged over a total population, Mr. Taylor had said, and I quote now from page 216 of his earlier statement, "Consider the cost to plant operation if a legal limitation of 5 rem is put upon the individual worker," and then discussed that point.

I have quoted this earlier in the record. He said this could be very costly and seriously retard the atomic energy industry. Possibly he knows more about this than Dr. Manov, but what Dr. Manov said was, and I quote from page 36 of volume 13 of the proceedings:

> What are the costs of routine radiological safety protection in atomic energy installations? From the administrative point of view, however, it is interesting to note that the Atomic Energy Commission spends approximately $100 per year per man to insure radiation protection and that the costs of other safety devices, conventional types, are quite small by comparison. It is estimated that the cost of radiation protection is about 1 percent of the total operating expenses and that if it were desired to protect against radiation by an additional factor of 10, the cost would be 2 percent of the total operating costs.

In other words, it would have been possible to take the maximum permissible limit, which at that time was 300 milliroentgens per man per week, and reduce it to 30 milliroentgens per man per week at a cost of only 1 percent of the operating costs of the Commission or of the particular installation.

For anyone to say that the protection to health which this would afford would be excessive and retard the industry in my opinion raises a collective bargaining issue that should be discussed across the collective bargaining table, rather than set by a self-established, self-voluntary chosen committee, and have their recommendations accepted by agencies of the Government as the basis for establishing legal limitations.

This recommendation was not so ridiculous because your first witness at these hearings, Mr. Whipple, presented a paper at that time. This is a paper entitled, "Radiation Hazard Control for Power Reactors," and it is published and released by the American Institute of Chemical Engineers as Pre-print No. 17 of the Conference of Nuclear Engineering and Science Congress held in Cleveland in December 1955. If I may merely read his summary conclusions of a long paper on this subject——

Representative HOLIFIELD. Are you sure he has not revised his opinion since he put that out in 1955?

Mr. GOODMAN. I am sure he has. It seems to me if one were to take all this in the context in which I am presenting it to you, when the figures were made available it was interesting to me that when members of this committee asked the AEC in March of this year if they had figures on the cost of safety, they advised you that they did not have any available. They did at that time.

Representative HOLIFIELD. Proceed.

Mr. GOODMAN. Summary, and I quote:

> The record maximum permissible exposure of 0.3 roentgens per week has a small but significant risk for a lifetime occupational exposure. It is strongly recommended that a figure no greater than 0.1 of this be taken as the criteria for nuclear plant operation—nuclear powerplant. Proper regard for control of radiation hazard in the plant design will reduce the risks to employees and will also reduce operating costs.

If standards are to be set primarily on the basis of a consideration of cost, it seems to me that they ought to be set by a division of government properly established by this committee, and not by a voluntary committee headed by a physicist who says in his opening or who has said in the past that he has taken on this task without the proper scientific basis for doing so.

I would recommend, therefore, that the way to proceed would be for this committee to reject the Commission's proposals, to establish a division either in the Public Health Service or in such an organization as the National Academy of Sciences, which independently would have the legal obligation and the powers and the funds to establish maximum permissible standards based upon the findings of scientific fact and not based, as Mr. Taylor says, on the question of the cost to industry of development of this science.

Representative DURHAM. I am sure you are aware of the record that has been established by the AEC and it has operated pretty large industrial plants throughout the country. I don't think you can contradict that. Their safety record is better than any industrial concern that I know of in the whole country.

Mr. GOODMAN. I would not want to ask the executive director of the committee to take the stand, but he has sat with me with workers from the plants who say that these records are inaccurate and that these records have been doctored. I merely mention that because he has independently heard these workers say that workers have been brought into the plant on stretchers in order to be able to show that the particular plant did not have lost time for a given pay period.

Mr. RAMEY. This was at a public meeting at which I made a talk. I also suggested that these facts be documented and be submitted to the committee for its consideration in the employee radiation hearings.

Representative HOLIFIELD. They did have the opportunity to come in.

Mr. RAMEY. Yes. This was before the employee radiation hearings.

Representative HOLIFIELD. I have heard a lot of speeches and heard a lot of statements made, too, by people that did not stand up on further investigation.

Mr. GOODMAN. A similar paper was presented.

Representative HOLIFIELD. We are getting along pretty well, Mr. Goodman. You have had an hour and 15 minutes on the stand and it is 15 minutes past five. We do not want to cut you short so you go right ahead.

Mr. GOODMAN. A similar paper was presented at the Atomic Industrial Forum in September 1956, entitled, "Safety Costs for Reactor Projects." I present these because I believe the committee has not had this kind of information as to what safety costs, and this in view of the quotations that I have read to you from those who have been in charge seems to be the fundamental question. If it is, the workers in industry will insist on the maintenance of the highest safety standards and reject the attempt of the Commission to curtail their responsibility in this field.

At this point I would like to request that the statement on this matter, though it is entitled, "Employee Radiation Hazards and Workmen's Compensation" by the AFL–CIO Executive Council, which has been distributed to the members of the committee, be included in the record, because it discusses primarily the whole question of State versus Federal regulations.

Representative HOLIFIELD. Which is this?

Mr. GOODMAN. The one you have before you, sir.

Representative HOLIFIELD. The one that is dated February 19 at Puerto Rico?

Mr. GOODMAN. Yes.

Representative HOLIFIELD. That will be accepted.

(The document referred to follows:)

STATEMENT BY THE AFL–CIO EXECUTIVE COUNCIL ON ATOMIC RADIATION HAZARDS AND WORKMEN'S COMPENSATION, SAN JUAN, P.R., FEBRUARY 19, 1959

Organized labor has urged rapid and widespread development of peaceful uses of atomic energy—but we insist that it go hand in hand with, and not at the expense of, safety of workers and the general public.

The objective of safe progress has by and large been reasonably achieved thus far in the United States. This is so primarily because control of atomic radiation hazards has been a Federal responsibility. But there has been a concerted and broadening effort to put the job in the hands of the States.

We emphatically oppose any dilution of Federal responsibility for atomic health and safety. The departure from a Federal program would be dangerous because the great bulk of States and localities cannot provide the necessary financial or personnel resources or the continuing interest and attention required for an effective radiation control program. Moreover, abandoning of responsibility to States and localities would inevitably breed a multiplicity of radiation regulations with resulting conflict, duplication, and perilous departure from sound standards.

We cannot afford such relaxation of radiation safety enforcement. The significance of radiation safety goes beyond the number of potential injuries or deaths. Failure to control radiation hazards thoroughly may jeopardize confidence in their controllability with a resulting loss of worker and public confidence and the growth of a fear of radiation which can seriously impede all atomic progress.

Radiation hazards also have raised special problems in the field of workmen's compensation. Here the States have had full responsibility. They have shied away from needed action as though it were radioactive. They have an almost unmarred record of failure to revise the compensation laws to take account of radiation protection needs.

As was acknowledged in the recent convention report of the International Association of Industrial Accident Boards and Commissions, the organization of State workmen's compensation officials, "there can be little doubt that most workmen's compensation jurisdictions today provide totally inadequate protection for workers against radiation hazards."

The record of continued inaction by the States has made it evident that the only means of gaining necessary compensation protection for the Nation's radiation workers is through Federal legislation.

There is already a Federal safety program, with Federal standards and a Federal licensing system, governing radiation uses. And there is Federal insurance for nuclear reactors providing financial protection to industry and to the members of the public affected in the event of an atomic accident. A companion measure is now needed to provide corresponding Federal action to provide workmen's compensation for the needs of injured workmen.

The Congressional Joint Committee on Atomic Energy has announced hearings early in this session on radiation hazards and workmen's compensation. We urge that it act to have the Congress (1) reaffirm and reinforce the system of Federal responsibility for radiation hazard control and (2) adopt a Federal program of workmen's compensation protection for workers subject to radiation hazards. The appropriate Federal agencies with experience in the health, safety, and compensation fields should be given the full authority and resources to develop and enforce effective radiation control and workmen's compensation programs in all industries involving atomic materials.

Representative HOLIFIELD. Did you wish this letter from Mr. Sigal to Chairman Anderson also inserted in the record?

Mr. GOODMAN. Yes, sir; if you will, please.

Representative HOLIFIELD. It will be accepted.

(The letter referred to follows:)

INDUSTRIAL UNION DEPARTMENT, AFL–CIO,
Washington, D.C., April 24, 1959.

HON CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
U.S. Capitol, Washington, D.C.

DEAR SENATOR ANDERSON: On April 23, 1959, a report was issued by the National Committee for Radiation Protection setting forth its latest revisions of the maximum permissible concentrations of radioactive materials in the human body and in air and water.

These revisions gravely disturb us. They raise basic questions not only of scientific method, but of governmental procedure as well. While the NCRP has no governmental or official status, its recommendations are relied upon by Government agencies as well as private organizations. You will recall that a short time ago questions were raised in testimony before you regarding the procedures followed by NCRP, and the validity of the standards which they have set. The latest action of NCRP again brings this problem to the fore.

The recommendations of NCRP purport to be based on a 5-year study. The inference certainly is that sufficient information has been collected to warrant reliable scientific conclusions necessitating the revision of the previous standards. The fact of the matter appears to be, however, that the Committee does not have adequate information on which to base its conclusions. Its own statement declares:

"When we can measure more accurately the body burden of radioisotopes in the various body organs, we will have advanced further toward a practical solution of the problem."

This appears to us to be a confession that criteria and knowledge do not now exist by which reliable maximum permissible concentrations in the human body can be set. Under these circumstances it appears to be a highly dangerous business to double the limits for occupational exposure. We are constrained to suspect that issuance of these revisions at this time, following wide public concern over the extent and speed of radioactive fallout, is not a mere coincidence. If our suspicions are justified, the procedures of this Committee, to say the least, are open to question.

In the past, the method of calculating the maximum permissible limit for each radioisotope was described by Dr. K. Z. Morgan as follows:

"For the most part these values are based on the assumption that the permissible amount of a radioisotope in the body is one which will result in the accumulation of the radioisotope in the critical body organ, such that the critical organ will be exposed at a rate of 0.3 rems per week."

In 1957, the permissible exposure rate was reduced to 0.1 rem per week. If the Committee were consistent, it should then have recalculated the permissible

level of concentration based on that reduced exposure standard. They failed to do this.

The release of the Committee fails to state, except in the most general terms, the nature of the information on which it has based its revisions. It is our understanding that this information is not now available to the scientific community.

In the light of the extreme importance of this whole problem, I urge the Joint Committee on Atomic Energy to make a thorough investigation at the earliest possible moment into the methods by which the NCRP arrived at its conclusions. We urge the Committee to demand that Dr. Lauriston Taylor present to your committee for publication the information upon which the NCRP revisions were made. We also urge your committee to examine the problem of whether or not the NCRP, a private organization, should provide the standards by which Government agencies determine the possible limits of radiation exposure. In our view it is imperative that such a group should be under governmental direction.

Sincerely yours,

BENJAMIN C. SIGAL,
Chairman, IUD Atomic Energy Technical Committee.

Mr. GOODMAN. I have made my basic recommendations. I hope the committee will seriously consider the interests of the workers in the industry, though they had only a few of the witnesses in this current set of hearings before you. Thank you very much.

Representative DURHAM. I think the committee at all times has had great concern about that. That is the one reason we sit here day after day after day trying to fathom this thing.

Mr. GOODMAN. I think it is the most hard-working committee in Congress. I believe if the committee were in position to influence the executive arm of Government more, there would be even more progress in the atomic field than there has been. On the other hand, there are serious problems regarding occupational radiation hazards and, though the committee is busy, the workers in the industry feel that the interests of the workers in the plants should not be a secondary matter to the desire of the scientists, in my opinion, to find a more precise basis upon which they can make their recomemndations.

Representative HOLIFIELD. Has the committee or any of its subcommittees ever refused to hear testimony from representatives of the workers when requested?

Mr. GOODMAN. No, sir. You have been very generous.

Representative DURHAM. Housing and everything else.

Representative HOLIFIELD. If there are no further questions, the committee will be adjourned.

(Additional statements that were furnished for the record follow:)

STATE OF MINNESOTA,
EXECUTIVE OFFICE,
St. Paul, April 3, 1959.

Senator CLINTON P. ANDERSON,
Chairman Joint Committee on Atomic Energy
Senate Office Building, Washington, D.C.

DEAR SENATOR ANDERSON: By a letter of February 11, 1959, you informed me of the plans of the Joint Committee on Atomic Energy to consider certain questions in the atomic energy field of mutual interest both to Federal and State Governments. You also advised regarding certain proposed public hearings which were to cover an extensive period of time and numerous subjects.

In the State of Minnesota I have had an advisory committee consisting of some two dozen specially qualified individuals. This group has done a great deal of work both in the investigation of various aspects of atomic energy and radiation and in the formulation of reports and recommendations. However, it has been a voluntary group, and we have neither a full-time staff nor appro-

priations from which to pay expenses for this group. Consequently, it is not practical for us to have anyone attempt to follow the course of your hearings in any detail, and it will be difficult for us to offer testimony in person.

Nevertheless, there is at least one subject that seems to me to be of sufficient interest and importance to justify comment. Therefore, I request that you accept this letter as a statement of my position, and consider it as representing the position of my administration of the government of the State of Minnesota.

I am advised that the suggestion may be made that Congress should attempt to preempt the entire field of atomic energy and radiation so as to preclude action by the State governments within this area. It appears to me that this would be unsound and unwise for a number of reasons.

To begin with, the constitutional basis of Federal authority over atomic energy appears to be the war power of Congress. It seems to me that this is a tenuous basis for extending control and regulation over as wide and important a field as that of peacetime utilization of atomic energy.

Beyond this, it is clear even to a layman that within this field there are vast voids of knowledge. Even as to areas in which we think we know, there are disagreements between equally eminent and responsible scientists. Thus, it seems particularly appropriate that there should be some variety of viewpoint and approach in dealing with problems as to which we know so little, and as to which experimentation may be so important.

Finally, it seems to me that no case whatever can be made out for any need for Federal preemption in this field. It is, of course, obvious that no State can or should modify any requirement of Federal law or regulation so as to permit a more hazardous or less safe installation or utilization of atomic energy or radiation sources. However, no reason appears why States should not be permitted to establish more rigorous or careful standards for installations by private parties within their own jurisdictions than the Federal Government has seen fit to establish. If a State or its representatives feel that particular safeguards are necessary or appropriate to protect its citizens, it seems to me it should be entitled to establish these. This is true in many less important fields, and I think it should be true in the field of atomic energy.

It is obvious that I am suggesting only that the States be permitted concurrent jurisdiction to establish whatever safeguards relating to atomic energy installations or radiation sources or materials within their borders as they may deem proper. I do strongly urge that Congress should not adopt any legislation the purpose of which is to establish Federal preemption of this entire field. I think this would be unwise and potentially dangerous.

There are many technical aspects to this question, and I am not personally competent to discuss all of them. However, I have had highly competent and qualified advisers, some of whom may be known to you, and they believe that this position is a proper and necessary one. I fully concur with this, and therefore repeat my urgent request to you that whatever legislation be passed by Congress in this field shall make it clear that the Congress intends to permit the States concurrent authority to act, and does not intend to preempt the field of regulation of atomic energy and radiation sources and materials.

Sincerely yours,

ORVILLE L. FREEMAN, *Governor.*

CONGRESS OF THE UNITED STATES,
HOUSE OF REPRESENTATIVES,
May 11, 1959.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Washington, D.C.

DEAR CHAIRMAN ANDERSON: Dr. Shields Warren of the Cancer Research Institute, New England Deaconess Hospital, Boston, Mass., would appreciate it if his statement with regard to the possible transfer from the Atomic Energy Commission to the Public Health Service of certain responsibilities resulting from atomic developments could be made a part of the records of your committee. His statement follows:

"While there is no legislation as yet, there is an apparent move on the part of the U.S. Public Health Service to try to shift some of the responsibility for research in the biomedical field from the Atomic Energy Commission to the Public Health Service. The AEC has done an outstanding job over many years.

The Public Health Service has at present neither the manpower nor the competence to do the type of work that the AEC is doing in the biomedical field, and I think it very important that the AEC appropriation for biology and medicine be continued and even expanded. I have long urged on the Public Health Service their exercising some degree of judgment with regard to radioactive fallout levels and other public health aspects of atomic medicine, but I think it is a sound responsibility for them to take."

Yours sincerely,

LAWRENCE CURTIS.

INTERSTATE COMMERCE COMMISSION,
Washington, D.C., May 21, 1959.

Mr. JAMES T. RAMEY,
Executive Director, Joint Committee on Atomic Energy,
Congress of the United States,
Washington, D.C.

DEAR MR. RAMEY: I wish you would convey to Senator Anderson my thanks for allowing me the opportunity to review and supplement the statement sent him October 30, 1958, summarizing the activities of this agency with respect to Federal-State relationships in regulating radiation hazards. That letter, although it condenses our activities, furnishes a comprehensive outline of the procedures and activities and makes reference to documentation where the details and technical data may easily be found if needed by interested persons. It was believed that such concise presentation would avoid an unduly lengthy discussion and repetitive quotations, prove less complex to your committee, and at the same time provide ample explanatory advice.

Since these facts were reported, a representative of the Commission was appointed to attend conferences of the International Atomic Energy Agency with the view to developing a set of international regulations adaptable to all means of transport, and this panel succeeded in drafting what appear to be complete and acceptable regulations for radioactive materials of low activity. Another group will study the substances having high activity, criticality, special materials, and heat transfer. When these are consolidated, all countries should be shipping, marking, and otherwise taking precautionary measures under a uniform system which will cause little, if any, interference with domestic practices, and may tend to improve them in some respects. When official documentation is received, the Commission will seek the views and recommendations of interested organizations and agencies so that all desirable suggestions will be given consideration in a worldwide plan and which may, in turn, be a useful pattern for State and Federal regulations in the future.

My previous statement did not mention that the Commission is also represented on the interagency committees presently engaged in developing a plan for reporting and handling radiological incidents and the preparation of a plan of education dealing with such hazards and ways in which to avoid or minimize them, it being my belief that other agencies would cover the subject in detail. This planning incorporates a great deal of activity which will be of benefit to States and municipalities, and our staffs stationed throughout the country will undoubtedly be of material service in local areas both in promoting the educational campaigns and furnishing assistance in times of difficulty, depending upon the scopes of the program, and particularly where transportation by surface carriers is concerned.

Other than the above-mentioned activities, there appears to be little I can add to supplement the data already published in your printed report for March 1959.

Sincerely yours,

KENNETH H. TUGGLE, *Chairman.*

SACRAMENTO, CALIF., *May 21, 1959.*

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR SENATOR ANDERSON: You are presently holding hearings on Federal-State relationships in the promotion and regulations of atomic energy use. I would like to submit the following recommendations for your consideration.

I urge adoption of legislation to clarify Federal-State relationships with regard to the protection of public health and safety from radiation hazards incident to the possession or use of source byproduct and special nuclear materials. The California legislature has already expressed this request through passage of a joint resolution in April 1959.

I urge adoption of legislation to insure State participation in the conduct of the AEC's regulatory program including legislation to insure State participation in AEC licensing proceedings and in AEC inspection.

I urge that Federal agencies, particularly the AEC, and the U.S. Public Health Service, be directed to provide increased assistance to the States. Enlarged programs for training of professional and technical personnel to conduct radiation control programs and increased research into the effects of radiation and means of controlling exposure to radiation are vitally needed.

EDMUND G. BROWN, *Governor of California.*

ASSEMBLY JOINT RESOLUTION NO. 15—RELATIVE TO ATOMIC ENERGY AND RADIATION PROTECTION

Whereas California is a large user of atomic energy and radioactive materials in industry, medicine, agriculture, and research; and

Whereas radiation, if improperly used, presents a potential hazard to the health and safety of the people of this State; and

Whereas since the enactment of the Atomic Energy Act of 1954 by the Federal Government there has been a considerable amount of uncertainty as to the effects of that act upon the State's traditional responsibilities in the field of health and safety; and

Whereas there exists a questionable area of State jurisdiction regarding facilities and materials licensed by the U.S. Atomic Energy Commission which are potentially dangerous to the health and safety of human beings; and

Whereas while the Atomic Energy Commission has indicated upon many occasions its desire to cooperate with the States and its desire for State assistance in inspection and enforcement, neither Congress nor the Commission has clarified the relationship between the Federal Government, including the Atomic Energy Commission, and the States in this regard; now, therefore, be it

Resolved by the Assembly and Senate of the State of California, jointly, That the Legislature of the State of California respectfully memorializes the Congress of the United States to enact an amendment to the Atomic Energy Act of 1954 which will clarify the jurisdiction of a State with regard to the protection of the health and safety of the public from radiation hazards incident to the possession or use of those facilities and materials licensed by the Atomic Energy Commission under the provisions of the Atomic Energy Act of 1954; and be it further

Resolved, That the chief clerk of the assembly be hereby directed to transmit copies of this resolution to the President and Vice President of the United States, to the Speaker of the House of Representatives, and to each Senator and Representative from California in the Congress of the United States.

GENERAL ELECTRIC CO.,
Schenectady, N.Y., June 4, 1959.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Washington, D.C.

DEAR SENATOR ANDERSON: This letter sets forth my views on Federal-State relationships in the field of radiation protection. I would appreciate it if this letter were incorporated in the record of your recent hearings.

The wide discussion of the question has made it clear that a reasonable accommodation of Federal and State interests and of the interests of the public and of industry can be developed within the following framework:

1. The States should play an increasing role in the regulation of radiation hazards, and an amendment of the Atomic Energy Act which would permit them to play such a role is both timely and desirable.

2. On the other hand, there are certain activities, notably the construction and operation of reactors, which should, for the time being, continue to be subject to Federal regulation.

3. Steps should be taken to enable the States to develop a competence in the areas of regulation reserved to the Federal Government so that with the passage of time, the States will be able to assume broader regulatory responsibilities.

4. The areas of Federal and State jurisdiction should be delineated as clearly as possible and conflicting or overlapping regulations should be avoided.

The principal problem is how to define those areas which should be the responsibility of the States and those areas which should be reserved to the Federal Government. Here it would seem that the Federal Government should reserve jurisdiction on the basis of either of two criteria:

1. The activity is a matter of primary Federal concern; examples here are export or import of facilities or material and the conduct of operations in Government-owned facilities; or

2. The States have in general not yet acquired a technical competence to regulate the activity; the obvious example here is the construction and operation of reactors.

The bill recommended by the Commission seems on the whole a reasonable approach to the problem of defining at this stage the areas where the States and the Federal Government may each operate most effectively. As time goes on the States should, of course, assume broader responsibilities than those presently contemplated. The provisions in H.R. 7214 for State participation in Commission licensing proceedings, for Commission-State cooperation in formulating standards and in performing inspections, and for Commission assistance to the States are all desirable as enabling the States to build up a capability to assume these broader responsibilities.

H.R. 7214 provides for separated regulatory responsibilities on the part of the States and the Commission. This seems highly desirable. The point has been made many times that overlapping regulation would be quite burdensome to industry, and could be productive of delays, confusion, and conflict. It is also true that overlapping regulation can be ineffective and self-defeating. Clear lines of demarcation between the Federal and State jurisdictions are therefore essential.

Very truly yours,

FRANCIS K. MCCUNE,
Vice President, Atomic Business Development Marketing Services.

AMERICAN MUNICIPAL ASSOCIATION,
WASHINGTON, D.C., *June 15, 1959.*

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
U.S. Capitol, Washington, D.C.

DEAR SENATOR ANDERSON: While we had hoped to have a representative of the American Municipal Association testify personally before the Joint Committee on Atomic Energy on May 22 on the subject of Federal-State relations, circumstances unfortunately made that impossible. Subsequent to the hearings, we were advised by the Committee staff that we would have to have the association's statement filed with the Committee on or before June 15 in order for it to be included as a part of the hearing record.

Our statement on the subject of Federal-State relations in the field of atomic energy is enclosed.

We greatly appreciate having this opportunity to place our views on record with the Committee.

I am forwarding copies of this letter plus our statement to the members of your Committee.

Sincerely yours,

PATRICK HEALY, JR., *Executive Director.*

STATEMENT OF THE AMERICAN MUNICIPAL ASSOCIATION

The American Municipal Association is the national representative of approximately 13,000 municipal governments throughout the United States and Puerto Rico. It is organized on the basis of affiliation with State Leagues of Municipalities in 47 states, plus 225 direct member cities. Cities eligible for direct membership must have a population of 50,000 or more, be a State capital, or one of the State's 10 largest cities.

At the outset, it should be made clear that we believe that hearings limited strictly by design or otherwise to a discussion of "Federal-State relationships" in the field of atomic energy are destined to be incomplete and for that reason inconclusive and ineffective. The use of the term "Federal-State" is mistakenly assumed by many to automatically mean that since municipalities are "creatures of the State" there interests and views are represented and protected in any situation where the States as such are represented. This is most emphatically not so; speaking from considerable experience we can safely declare it is the rare and exceptional State that faithfully considers the interests of its local governments even in those matters of immediate and direct concern to the latter.

Municipalities may be "creatures of the State" in a legal sense, but in a practical sense, they are independent entities solely and immediately responsible for the provision of the services and protection their constituents deserve and demand. The State assumes no responsibility for such protection or services, nor does it suffer when the services or the protection cannot be adequately maintained. This is a fate reserved exclusively for the local official.

At our last annual American Municipal Congress the association's membership approved the following national municipal policy statement on atomic energy:

"Local communities and local officials have a direct concern and interest in the peaceful applications of atomic energy. The developments in this field mean new processes, new products, and new types of industrial plants in many localities. It also means new considerations in the operation of local government, in the responsibilities of local officials, and the health and safety of local people. Already several thousand firms and laboratories are licensed to use nuclear materials in some 1,500 cities and towns across the country, and the number is increasing.

"If local officials are to properly discharge their responsibility for the health, safety and welfare of their communities, it is necessary that they be informed about the developments in this field, and the specific community problems that result. In view of the continuing expansion in this field, it is imperative that local communities begin immediate preparations to deal with the impact of the peaceful atom on the health, fire, police, planning, and other activities of local government. We therefore resolve:

"1. To endorse the study proposed to be made by the American Municipal Association for the Atomic Energy Commission on the impact of peaceful atomic energy activities on local government. We also urge that the Atomic Energy Commission and other responsible organizations including industry, sponsor and assist in additional specific studies that may be needed; such as, transportation and handling of nuclear materials, disposal of radioactive wastes, special training of local personnel, and development of needed local ordinances. Further, that the results of such studies be published and made available in guide form, suitable for use by local officials.

"2. Municipalities should be notified of all persons, organizations, or firms who currently are licensed by the Atomic Energy Commission to handle atomic or radioactive materials, and further, that said municipalities should be notified in the future whenever a new license is issued by the Atomic Energy Commission.

"3. Member municipalities are urged to pass an ordinance requiring those who handle and use atomic or radioactive materials in the community, to register same with local government and that a specific local officer be designated for that purpose. Cities are also urged to consider setting up of proper facilities to monitor the radioactive conditions in the atmosphere, water supply, and general environment.

"4. The American Municipal Association shall spearhead the organization and maintenance of a central clearinghouse of information on atomic energy developments which affect local government. This will provide a central point to which local communities may turn for information. Also, local communities are urged to forward to the clearinghouse all pertinent information and experiences which will be helpful to other communities." (1958)

RADIATION STANDARDS

Several factors must be recognized primarily to demonstrate the need and requirement for controlling radiation hazards on a local as well as the Federal level. The great expanse of our Nation, the recognized advantages of regional and decentralized administration, and the long experience of States, municipalities, and local governments in enforcement and inspection in health, safety,

and industrial fields, are all easily acknowledged reasons for a sharing of this awesome responsibility.

More than half of the States have already taken action either through legislation or through adoption of regulations. An examination of their varying provisions serves to demonstrate a very important, and thus far neglected, need for a single set of standards on maximum levels of radiation exposure. This, in our opinion, is the responsibility solely of the Federal Government, which has the broadest interest in protecting the health and safety of its citizens and which through its preemption in the nuclear energy field has acquired the best knowledge and facilities to guide it in this impotrant function. Unless such uniformity is established, the efforts of the States, municipalities, and local governments will result in a hodgepodge of conflicting and chaotic regulations.

In the event that such a uniform standard is set, there still remains for the States the problem of the shortage of trained personnel to carry out inspection and enforcement of standards. It is doubtful that the States can develop the technical staffs or acquire the necessary facilities in a satisfactorily short period of time to deal with these problems adequately and effectively. The municipality, the governmental level which is closest to the citizen in matters affecting his everyday life, is more likely to assume this responsibility in making inspections of industrial establishments within its confines and in effectively enforceng the standards.

The need for a Federal-State-municipal relationship must be recognized and such a relationship established and maintained in order to insure the most effective and expeditious cooperation on all three levels. It is emphatically recommended that the role of the municipalities in inspection and enforcement of radiation standards be recognized by legislative direction to the effect that the Federal agency, whether the Atomic Energy Commission or the Public Health Service, which the Congress in its wisdom will decide is best suited to administer radiation control, is empowered to deal directly with the municipalities in carrying out this vital measure for the preservation of the health and safety of our citizens.

FEDERAL AVIATION AGENCY,
Washington, D.C. June 19, 1959.

MR. JAMES RAMEY,
Executive Director, Joint Committee on Atomic Energy,
Congress of the United States, Washington, D.C.

DEAR MR. RAMEY: In response to Senator Anderson's request cited in your letter of May 16, 1959, the Administrator of the Federal Aviation Agency submits the enclosed amended report on "Federal-State Relationships in Regulating Radiation Hazards." The report outlines the responsibilities of the Administrator of the Federal Aviation Agency with respect to the development, administration, and enforcement of regulations governing the transportation of radioactive materials by aircraft. Federal-State relationships do not become involved in the discharge of these responsibilities.

The Federal Aviation Agency hopes that the enclosed report may be of some assistance to the Joint Committee on Atomic Energy.

Sincerely yours,

ROBERT E. WILLIAMS,
Deputy Chief, Office of Congressional Liaison.

FEDERAL-STATE RELATIONSHIPS IN REGULATING RADIATION HAZARDS REPORT OF THE FEDERAL AVIATION AGENCY TO THE JOINT COMMITTEE ON ATOMIC ENERGY

The Administrator of the FAA is responsible, among other things, for the promotion of the safety of flight of civil aircraft by prescribing such rules and regulations, or minimum standards governing practices, methods and procedures, as he may find necessary to provide adequately for safety in air commerce. To the extent that such rules, regulations, or standards govern the transportation of radioactive materials by aircraft, the Federal Aviation Agency is involved in the regulation of radiation hazards. The establishment and enforcement of such rules, regulations, and standards, and the administrative processes related thereto do not generally involve an element of Federal-State relationships. In the discharge of its own responsibilities relating to the transportation of radioactive materials the Federal Aviation Agency has had no occasion to deal with the States on the question of regulating radiation hazards.

STATUTORY AUTHORITY

Section 601 of the Federal Aviation Act of 1958 provides that "The Administrator is empowered and it shall be his duty to promote safety of flight of civil aircraft in air commerce by prescribing and revising from time to time * * * Such reasonable rules and regulations, or minimum standards, governing other practices, methods, and procedure, as the Administrator may find necessary to provide adequately for national security and safety in air commerce."

Section 902(h) of the Federal Aviation Act of 1958 provides that, "In the exercise of his authority under title VI of this act, the Administrator may provide by regulation for the application in whole or in part of the rules or regulations of the Interstate Commerce Commission (including future amendments and additions thereto) relating to the transportation, packing, marking, or description of explosives or other dangerous articles for surface transportation, to the shipment and carriage by air of such articles."

CIVIL AIR REGULATIONS

Part 49 of the Civil Air Regulations prescribes two principal categories of requirements:

Shipping requirements, which include packing and marking, labeling, certification, and containers for liquids; and

Loading and handling requirements, which include—cargo location, notification of pilot in command, damaged articles, quantity limitations, and special requirements for radioactive materials.

In general, the requirements of part 49 are consistent with the regulations of the Interstate Commerce Commission governing the surface transportation of radioactive materials.

The Administrator of the Federal Aviation Agency may permit deviations from the prescribed requirements subject to such terms, conditions, and limitations as he finds necessary in the interest of safety in air commerce. Section 49.2 also provides for certain exemptions for radioactive materials shipments made by or under the direction or supervision of the Atomic Energy Commission.

THE ASSOCIATION OF THE BAR OF THE CITY OF NEW YORK,
SPECIAL COMMITTEE ON ATOMIC ENERGY,
New York, N.Y., June 29, 1959.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States, Washington, D.C.

DEAR SIR: We appreciate very much having an opportunity to express our views to the Joint Committee on the proposed legislation, S. 1987 and H.R. 7214, which would amend the Atomic Energy Act of 1954 to provide for cooperation between the Atomic Energy Commission and the States.

We consider this proposed legislation to be of major importance and hope that it will be adopted at an early date. We believe the time has come when Federal law should provide for a greater participation by State governments and a consequent lessening of Federal control to permit the peaceful atomic industry to grow in a more conventional and normal environment than has been possible in the past.

We therefore urge that the Joint Committee consider the proposed legislation at its early convenience and report out a bill that can be considered in this session of Congress.

It is our opinion that the bill as introduced is desirable essentially as it is written, except that we believe it should be modified to make it quite clear that the phase of atomic energy development the Nation is now experiencing is transitional and the bill is an interim one. During this phase, the States should have as large a role as possible, not only in regard to such matters as the control of radioisotopes, small quantities of fissionable material, and natural uranium and thorium, but also in regard to the location of such major facilities as nuclear reactors and waste disposal sites.

Our committee has also considered the difficult problems presented by the legitimate concern of the States in the selection of suitable sites for major nuclear installations. We are familiar with the modifications to the bill recommended by the director of the New York State Office of Atomic Development

in his letter to you of June 17, 1959. While the suggested modifications are not free from difficulties, it is the consensus of our committee that the suggested compromise constitutes a reasonable solution to the difficult question of defining the extent of State jurisdiction in regard to major nuclear installations.

We would also suggest that, throughout the bill, instead of referring to an "agreement" between the Commission and the States, either the word "arrangement" or "plan" be used. The word "agreement" carries with it formal legal connotations which may raise technical questions with respect to the relationships and authority of the parties. Since the objective is to devise a method for transferring certain responsibility in an orderly and effective way to the States, we think the word "arrangement" or "plan" more appropriate.

If our committee can be of any further assistance to you in this matter, we hope very much that you will call upon us.

Sincerely yours,

OSCAR M. RUEBHAUSEN,
Chairman.

(Thereupon at 5:20 p.m., Friday, May 22, 1959, the hearing was adjourned subject to the call of the Chair.)

FEDERAL-STATE RELATIONSHIPS IN THE ATOMIC ENERGY FIELD

WEDNESDAY, AUGUST 26, 1959

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D.C.

The Joint Committee met, pursuant to notice, at 10:10 a.m., in room F–88, the Capitol, Hon. Clinton P. Anderson (chairman of the Joint Committee) presiding.

Present: Senators Anderson, Jackson, Hickenlooper, Dworshak, Aiken, Bennett; Representatives Price, Van Zandt, Hosmer, and Westland.

Present also: James T. Ramey, executive director, John T. Conway, assistant director, David R. Toll, staff counsel, G. Edwin Brown, Jr., and George F. Murphy, Jr., professional staff members, Edward J. Bauser, technical adviser, Richard T. Lunger, staff consultant, Joint Committee on Atomic Energy.

Representing the Atomic Energy Commission: John A. McCone, Chairman; Gen. A. R. Luedecke, General Manager; Charles Manly, Reactor Development Division; Don Burrows, Comptroller; Neil D. Naiden, Deputy General Counsel; Robert Lowenstein, Office of the General Counsel; Edward Bloch, Director, Division of Production; Curtis A. Nelson, Director of Inspection; Richard X. Donovan, congressional liaison; R. E. Hollingsworth, Assistant General Manager for Administration; Col. John Hood, Division of Military Application; and Sam Goldenburg.

Chairman ANDERSON. The committee will be in order.

The Joint Committee on Atomic Energy is meeting this morning to receive comments by Atomic Energy Commission representatives on S. 2568 and H.R. 8755, to amend the act by adding a new section 274 with respect to cooperation with States. These bills are similar to the original bills (S. 1987 and H.R. 7214) requested by the Commission, but incorporate certain possible revisions made as a result of the committee hearings on Federal-State relationships in May of this year.

We have invited Mr. McCone and other members of the AEC to comment on these bills, including the possible revisions under consideration by the Committee.

May I say I received a protest from the U.S. Chamber of Commerce over reporting out the Federal-State cooperation bill without a public hearing. I asked them if they would please read the bills and see if they did not follow the public hearings we already have had.

The Chamber of Commerce then called back and said that they wished to withdraw their objection and permit us to go ahead and get something done, and that we could begin to study this problem and get something enacted.

(The bills referred to follow:)

[S. 2568 and H.R. 8755, 86th Cong., 1st sess. Redraft of S. 1987 and H.R. 7214]

A BILL To amend the Atomic Energy Act of 1954, as amended, with respect to cooperation with States

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following section be added to the Atomic Energy Act of 1954, as amended:

"SEC. 274. COOPERATION WITH STATES.—

"a. It is the purpose of this section—

"(1) to recognize the interests of the States in the peaceful uses of atomic energy, and to clarify the respective responsibilities under this Act of the States and the Commission with respect to the regulation of byproduct, source, and special nuclear materials;

"(2) to recognize the need, and establish programs for, cooperation between the States and the Commission with respect to control of radiation hazards associated with use of such materials;

"(3) to promote an orderly regulatory pattern between the Commission and State governments with respect to nuclear development and use and regulation of byproduct, source, and special nuclear materials;

"(4) to establish procedures and criteria for discontinuance of certain of the Commission's regulatory responsibilities with respect to byproduct, source, and special nuclear materials, and the assumption thereof by the States;

"(5) to provide for coordination of the development of radiation standards for the guidance of Federal agencies and cooperation with the States; and

"(6) to recognize that, as the States improve their capabilities to regulate effectively such materials, additional legislation may be desirable.

"b. Except as provided in subsection c., the Commission is authorized to enter into agreements with the Governor of any State providing for discontinuance of the regulatory authority of the Commission under chapters 6, 7, and 8, and section 161 of this Act, with respect to any one or more of the following materials within the State—

"(1) byproduct materials;

"(2) source materials;

"(3) special nuclear materials in quantities not sufficient to form a critical mass.

During the duration of such an agreement it is recognized that the State shall have authority to regulate and license the materials covered by the agreement for the protection of the public health and safety from radiation hazards.

"c. No agreement entered into pursuant to subsection b. shall provide for discontinuance of any authority and the Commission shall retain authority and responsibility with respect to regulation of—

"(1) the construction and operation of any production or utilization facility;

"(2) the export from or import into the United States of byproduct, source, or special nuclear material, or of any production of utilization facility;

"(3) the disposal into the ocean or sea of byproduct, source, or special nuclear waste materials as defined in regulations or orders of the Commission;

"(4) the disposal of such other byproduct, source, or special nuclear material as the Commission determines by regulation or order should, because of the hazards or potential hazards thereof, not be so disposed of without a license from the Commission. Notwithstanding any agreement between the Commission and any State pursuant to subsection b., the Commission is

authorized by rule, regulation, or order to require that the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing source, byproduct, or special nuclear material shall not transfer possession or control of such product except pursuant to a license issued by the Commission.

d. The Commission shall enter into an agreement under subsection b. of this section with any State if—

(1) the Governor of that State certifies that the State has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by the proposed agreement, and that the State desires to assume regulatory responsibility for such materials; and

(2) the Commission finds that the State program is compatible with the Commission's program for the regulation of such materials, and that the State program is adequate to protect the public health and safety with respect to the materials covered by the proposed agreement.

"e. (1) Before any agreement under subsection b. is signed by the Commission, the terms of the proposed agreement and of proposed exemptions pursuant to subsection f. shall be published once each week for three consecutive weeks in the Federal Register; and such opportunity for comment by interested persons on the proposed agreement and exemptions shall be allowed as the Commission determines by regulation or order to be appropriate.

"(2) Before the Commission enters into any proposed agreement or amendment thereto under subsection b., the proposed agreement or amendment shall be submitted to the Joint Committee, and a period of forty-five days shall elapse while Congress is in session (in computing such forty-five days, there shall be excluded the days on which either House is not in session because of adjournment for more than three days): *Provided, however,* That the Joint Committee after having received the proposed agreement or amendment may by resolution in writing waive the conditions of or all or any portion of such forty-five day period.

"(3) Each proposed agreement shall include the proposed effective date of such proposed agreement or exemptions. The agreement and exemptions shall be published in the Federal Register within thirty days after signature by the Commission and the Governor.

"f. The Commission is authorized and directed, by regulation or order, to grant such exemptions from the licensing requirements contained in chapters 6, 7, and 8, and from its regulations applicable to licensees as the Commission finds necessary or appropriate to carry out any agreement entered into pursuant to subsection b. of this section.

"g. The Commission is authorized and directed to cooperate with the States in the formulation of standards for protection against hazards of radiation to assure that State and Commission programs for protection against hazards of radiation will be coordinated and compatible.

"h. There is hereby established a Federal Radiation Council, consisting of the Surgeon General, the Chairman of the Atomic Energy Commission, the Secretary of Defense, the Secretary of Commerce, the Secretary of Labor, the Chairman of the of the National Academy of Sciences, the Chairman of the National Committee on Radiation Protection, or their designees, and two members appointed by the President. One such appointed member shall be a qualified expert in the field of biology and medicine and one in the field of health physics, and either may be an employee of a private, State, or local agency concerned with radiation hazards and standards. The Special Assistant to the President for Science and Technology, or his designee, is authorized to attend meetings, participate in the deliberations of, and to advise the Council. The Chairman of the Council shall be designated by the President, from time to time, from among the members of the Council. The Council shall advise the President with respect to radiation matters, directly or indirectly affecting health, including guidance for all Federal agencies in the formulation of radiation standards and in the establishment and execution of programs of cooperation with States. The Council shall also perform such other functions as the President may assign to it by Executive order.

"i. The Commission in carrying out its licensing and regulatory responsibilities under this Act is authorized to enter into agreements with any State, or

group of States, to perform inspections or other functions on a cooperative basis as the Commission deems appropriate. The Commission is also authorized to provide training, with or without charge, to employees of, and such other assistance to, any State or political subdivision thereof or group of States as the Commission deems appropriate. Any such provision or assistance by the Commission shall take into account the additional expenses that may be incurred by a State as a consequence of the State's entering into an agreement with the Commission pursuant to subsection b.

"j. The Commission, upon its own initiative after reasonable notice and opportunity for hearing to the State with which an agreement under subsection b. has become effective, or upon request of the Governor of such State, may terminate or suspend its agreement with the State and reassert the licensing and regulatory authority vested in it under this Act, if the Commission finds that such termination or suspension is required to protect the public health and safety.

"k. It is the intention of this Act that State laws and regulations concerning the control of radiation hazards from byproduct, source, and special nuclear materials shall not be applicable except pursuant to an agreement entered into with the Commission pursuant to subsection b.: *Provided, however,* That States may adopt registration requirements for such materials and may inspect the use of such materials within the State to assure compliance with the Commission's regulations. Nothing in this section shall be construed to affect the authority of any State or local agency to regulate activities for purposes other than protection against radiation hazards.

"l. With respect to each application for Commission license authorizing an activity as to which the Commission's authority is continued pursuant to subsection c., the Commission shall give prompt notice to the State or States in which the activity will be conducted of the filing of the license application; and shall afford reasonable opportunity for State representatives to offer evidence, interrogate witnesses, and advise the Commission as to the application without requiring such representatives to take a position for or against the granting of the application.

"m. No agreement entered into under subsection b., and no exemption granted pursuant to subsection f., shall affect the authority of the Commission under subsection 161 b. or i. to issue rules, regulations, or orders to protect the common defense and security, to protect restricted data or to guard against the loss or diversion of special nuclear material. For purposes of subsection 161i., activities covered by exemptions granted pursuant to subsection f. shall be deemed to constitute activities authorized pursuant to this Act; and special nuclear material acquired by any person pursuant to such an exemption shall be deemed to have been acquired pursuant to section 53.

"n. As used in this section, the term 'State' means any State, Territory, or possession of the United States, the Canal Zone, Puerto Rico, and the District of Columbia."

SEC. 2. Section 108 of the Atomic Energy Act of 1954, is amended by deleting the phrase "distributed under the provisions of subsection 53a.," from the second sentence.

Chairman ANDERSON. Mr. Chairman, we are very happy to have you with us this morning. You may proceed. I understand you have some time limitation and when you reach the stage where you have to leave, you may do so.

STATEMENT OF JOHN A. McCONE, CHAIRMAN, ATOMIC ENERGY COMMISSION

Mr. McCONE. Cooperation with the States: I will now turn to S. 2568 and H.R. 8755, a bill to amend the Atomic Energy Act of 1954, as amended, with respect to cooperation with States. Except with respect to provisions relating to the Federal Radiation Council, this bill is substantially similar to S. 1987 and H.R. 7214. The Commission testified at length at public hearings in May of this year in support of S. 1987 and H.R. 7214, which have been endorsed by the administration. We believe that the revised bill incorporates a

sound basis for allocating the respective responsibilities of the States and the Commission to protect the public health and safety against radiation hazards from source, byproduct, and special nuclear materials.

Under the revised bills, as under the earlier bills, procedures and criteria are established under which the Commission may turn over to individual States, as they become ready, certain defined areas of regulatory jurisdiction, namely, source, byproduct, and small quantities of special nuclear material. The control of radiation hazards associated with these materials is, we believe, well within the potential capabilities of the States. With appropriate encouragement and support, many of the States can become prepared to assume responsibility for control of radiation hazards associated with these materials.

Certain areas, as to which interstate, national, or international considerations would be paramount, would be excluded. In addition, certain areas would be excluded because the technical safety considerations are of such complexity that it is not likely that any State would be prepared to deal with them during the foreseeable future.

We would suggest that the entire first sentence of subsection k be omitted. The Commission had considered and decided against this provision in the bill which we submitted to the Joint Committee last May (S. 1987 and H.R. 7214). We believe that the first sentence states explicitly what is substantially implicit in the bill without the sentence.[1]

Chairman ANDERSON. Let us see what is being taken out. The first sentence reads:

> k. It is the intention of this Act that State laws and regulations concerning the control of radiation hazards from byproduct, source, and special nuclear materials shall not be applicable except pursuant to an agreement entered into with the Commission pursuant to subsection b: *Provided, however,* That States may adopt registration requirements for such materials and may inspect the use of such materials within the State to assure compliance with the Commission's regulations.

What do you think is wrong with that, now? Do you want to explain it?

Mr. MCCONE. Mr. Nelson, our Director of Inspection feels that this is an unnecessary condition. Will you answer that, Mr. Nelson?

Chairman ANDERSON. Mr. Nelson, do you think a State has laws on its books that give it control of special nuclear material?

Mr. NELSON. Not ownership.

Chairman ANDERSON. I did not ask you that. I said, Do you think any State has a law on its books that gives it control of special nuclear material?

Mr. NAIDEN. We are not aware of any, Mr. Anderson.

Chairman ANDERSON. Does any State have a law that gives it control of byproduct, source, or special nuclear materials?

Mr. NAIDEN. We are not aware of any.

Chairman ANDERSON. Then why do you object to the provision? Identify yourself for the record.

Mr. NAIDEN. My name is Neil Naiden. I am in the Office of the General Counsel.

If this section is in the bill it may sweep into the net some State laws——

[1] For subsequent letter from AEC concerning subsection k, see p. 500.

Chairman ANDERSON. Which laws?

Mr. NAIDEN. This bill preempts the field for the Federal Government and, if this section is in the bill, Mr. Anderson, it may be interpreted so as to strike down some laws we really do not want to strike down, and of which we may not be aware.

Chairman ANDERSON. Give us an example of what law and in what States.

Mr. NAIDEN. We cannot give you that example.

Chairman ANDERSON. How can you say it strikes down a law if you do not know if it does? You have just said that it strikes down a law. What law in what State?

Mr. NAIDEN. We cannot give you that example.

Chairman ANDERSON. Why say it, then?

Mr. NAIDEN. We were trying to avoid a problem in advance, Mr. Anderson. We do not think it changes the meaning of the bill.

Senator HICKENLOOPER. Mr. Chairman, he said it may strike down. I do not think he made a positive statement. But I think he might be able to give us an example of some possibilities of the laws it might strike down.

Could you do that?

Chairman ANDERSON. All we are trying to do is to get out a bill we understand the Commission is interested in, and I can assure you the country seems to be interested in it.

Mr. NAIDEN. Yes, sir.

Chairman ANDERSON. Now, you want to take this section out. It may be all right. Possibly we should take it out—I do not know—but we ought to have a reason.

Mr. MCCONE. Mr. Nelson, you are the one that made this special appeal. Will you explain to the Senator why you made that appeal?

Chairman ANDERSON. What is the basis for the appeal?

Mr. NELSON. It seems to me, sir, if all State law and regulation which has been built up over the past 2 or 3 years, with our encouragement, with our knowledge. to control sources of radiation, if they are struck down overnight, how can they prepare themselves——

Chairman ANDERSON. You are right back in the same field. What laws have been built up over the past 2 or 3 years that this would strike down?

Mr. NELSON. Quite a number of States, including Connecticut, New Jersey, New York——

Representative VAN ZANDT. California?

Mr. NELSON. California, Pennsylvania, have laws and regulations as a result of these laws which regulate sources of radiation.

Chairman ANDERSON. Sources of radiation?

Mr. NELSON. Yes, sir.

Representative VAN ZANDT. Radiation hazards.

Chairman ANDERSON. Mr. Toll.

Mr. TOLL. To my knowledge, this would not affect any State law. It might affect the regulations promulgated by the State of Minnesota.

Chairman ANDERSON. Which requires something about the licensing of a reactor, which I think is just as wrong as it can be.

Mr. NELSON. So do I.

Chairman ANDERSON. I think the State of Minnesota is wrong in this, and you are worried about this striking down some regulation.

If it is going to strike down a law, would you name the law? That is the best way to get at these things.

Mr. NELSON. The States I have named, Senator Anderson, I cannot give the name of the law, but I can tell you what the law does. It sets up the authority and the appropriation to control atomic hazards and byproducts.

Chairman ANDERSON. Go on.

Mr. NELSON. That is source material and special nuclear material.

Mr. ANDERSON. And the State, then, is able to control the hazards of special nuclear material?

Mr. NELSON. Yes, sir, some States.

Senator HICKENLOOPER. I do not understand that.

Chairman ANDERSON. I do not, either.

Excuse me. Senator Aiken has been trying to get in there.

Senator AIKEN. The control of radiation hazards, naturally, affects health, does it not?

Mr. NELSON. Yes, sir.

Senator AIKEN. And does not the Constitution give each State the right to enact more stringent health regulations than those in Federal law?

Mr. NELSON. It is my understanding it does; yes, sir.

Senator AIKEN. Could you set aside that constitutional authority in regard to radiation hazards, or would that be advisable, and say it applies to all health hazards, except radiation?

I think you would run into trouble because every State has—and the States delegate to the cities in many cases—the right to control health hazards and to enact more stringent regulations than the Federal law provides.

I am thinking particularly in terms of milk, because that may be the best example we have. I am just wondering if you could enact legislation which would prevent the States from setting up more stringent health regulations than the Federal law provides for.

Chairman ANDERSON. I am only worried about what happens in the Minnesota sort of situation. There they say you cannot locate a reactor no matter how you want to locate it unless the health commissioner of that State approves it. I think that becomes very serious because the Federal Government may decide to license a reactor as in Dresden, in Illinois, and then the State of Illinois says, "Wait a minute. We ought to know how close this is going to be to population centers and we want to know all of these things." The State probably does not have the experience or the facilities of the Federal agency to do it, and yet it seeks control of it.

It may be desirable to strike out this language. I do not know, but I want something more than a statement that it is going to strike down some laws that do not exist but which may someday have to be enacted?

Senator Hickenlooper?

Senator HICKENLOOPER. As I analyze this section, just having done so in the last minute or two quickly, the first part of k. states flatly that "State laws and regulations concerning the control of radiation hazards" and so on, "shall not be applicable except * * * with the consent of the Commission," but up to that point it means that State laws have no force and effect unless agreed to by the Com-

mission. That puts it completely within the province of the Government with respect to control of radiation hazards from byproduct, source, and special nuclear materials.

And here is your proviso: "*Provided, however*, That States may adopt registration requirements for such materials and may inspect the use of such materials within the State to assure compliance with the Commission's regulations."

Still that is within the power of the Commission because the Commission makes the regulations and all the State does is conform. The State has no independent sovereignty in that field whatsoever up to that point.

Then comes the statement: "Nothing in this section shall be construed to affect the authority of any State or local agency to regulate activities for purposes other than protection against radiation hazards."

Now, it is the interpretation of that proviso which I think is important.

Senator AIKEN. Does that not run into the question I asked, the constitutional question?

Senator HICKENLOOPER. We undertake here in this section, first, to put the complete control of radiation hazards, regardless of the source, in the Federal Government. So we are preempting that field in this section. That is preempted in this section. The States have nothing to say about it.

A State can believe that a reactor right in the midst of a big city is absolutely hazardous to their people, and the Commission or the Federal Government can say it is not hazardous, and that is all there is to it—the State has nothing to say about it. Is that correct?

Mr. LOWENSTEIN. Senator——

Chairman ANDERSON. Identify yourself for the record.

Mr. LOWENSTEIN. I am Robert Lowenstein. I am in the General Counsel's Office.

Senator Hickenlooper, there is a qualification, which is in the next subsection, which assures to each State the opportunity to be notified in advance and that the State may have full participation in the Commission's hearings with respect to reactors.

Senator HICKENLOOPER. That does not make any difference; it finally rests with the Federal Government.

Mr. LOWENSTEIN. The final authority; yes, sir.

Senator HICKENLOOPER. It does not make any difference, then. They can talk all they want to, they can have their day in court if they want to——

Mr. LOWENSTEIN. That is right.

Senator HICKENLOOPER. But they have no sovereignty or basic control.

Chairman ANDERSON. Mr. Ramey.

Mr. RAMEY. Is it not the Commission position, that without the lead-off language of subsection k, the same result is legally intended and legally effective?

Mr. LOWENSTEIN. Yes.

Mr. RAMEY. That the Commission has preempted this field but they do not exactly want the statute to say so.

Mr. LOWENSTEIN. They have no——

Chairman ANDERSON. Will you answer the question?

Mr. LOWENSTEIN. Yes, sir. And we would accept the sentence. We have no strong objection.

Chairman ANDERSON. In other words, you do not mind taking the authority if you take it under the cover of darkness, but you do not want to take it out in the light?

Mr. LOWENSTEIN. Let me explain it a little bit more.

Chairman ANDERSON. You have preempted the field, have you not?

Mr. LOWENSTEIN. Yes, sir.

Chairman ANDERSON. Why do you have objections to saying that you have done so?

Mr. LOWENSTEIN. We have no strong objections, if the committee wishes it we will not make a strong objection. And I do not believe this statement is meant to indicate we have a strong objection.

Our objection is based only on the thought—and we do not press it—that under the constitutional doctrines of preemption there is a little bit more—and not much but a little bit more—latitude of interpretation as to whether or not any particular State law—we do not know of any yet but they might pass one—might or might not be inconsistent with what the courts have laid down in doctrines of preemption. Our suggestion is only to get away from the rigidity of statutory construction.

Senator HICKENLOOPER. Mr. Chairman, I would like to continue just a minute.

Do you think that the matter of basic constitutional law, that is, the rights and powers reserved to the States which are not specifically granted to the Federal Government, the rights and powers reserved to the States and the people under the 10th amendment—do you think we can preempt the use of radioactive materials except as the Government owns them and keeps title to them? In the absence of laws saying that nobody can produce radioactive materials, in the absence of those laws and giving the ability in a State to produce independently on its own radioactive materials, which they can do in small degrees in laboratories, do we have a right to go into the States and preempt the use or the application of radioactive materials?

Mr. LOWENSTEIN. Without the provisions of the act of 1954, I think the State would have full jurisdiction.

Senator HICKENLOOPER. I am not talking about the act now, but the constitutional question, if it comes up. Frankly, I doubt, if this is ever fully tested out in court, that outside of the fact of ownership, we can tell what the States must do, that is, only with properties that the Federal Government owns.

If we own the gadget that we want to put out in the State and the State wants to take it, we can say, "We own it, and you will either establish certain regulations for its use or we will not give it to you." But I am talking about the ability of a State, to get down to fundamentals, the ability of a State to make its own radioactive materials. Let us leave out the question of law that says the Government preempts that right, whether it can or not, which I do not know.

Can we move into a State and tell them what to do with radioactive materials, leaving out the question of ownership?

Chairman ANDERSON. I think that is an important question. It is like my owning a horse and saying you can ride it if I do not own it, but I do own it. That is like leaving out the question of ownership.

Senator HICKENLOOPER. No. The major basis of our control today probably comes from two sources. One is that we own the material and we only lease it out, or let it out; we do not transfer title to it. If we do, we can transfer under such conditions as the Federal Government says it wants to.

The other may be under the emergency situation, and I understand we are still in an emergency. We have been in one since 1932, so I guess we are still in it. But under the emergency provisions which arise under constitutional law, an emergency proposition, and the fact its major use might be considered for national defense, we might have some basis for preempting that, within the States.

Representative HOSMER. Will the gentleman yield?

Senator HICKENLOOPER. Yes.

Representative HOSMER. I think you have hit the nail on the head in that it is a constitutional question and ultimately must be decided by the courts.

Senator HICKENLOOPER. I am just questioning how far we are going to go in preempting the rights of the States.

Representative HOSMER. We cannot go any further than the Constitution says. What the Constitution says is what the court says it says. Without this declaration of intention, you could get this bill into court just as easy as you could with it. But without it the court might fiddle and fool around with a lot of other things rather than following this declaration of intention. Therefore, from the standpoint of judicial clarity of interpretation, it is probably a good thing to have it in here. However, probably I think we should have a separability clause. Then you do not let the courts fiddle around with something else. They say, "All right, they intended to preempt it," and then we get into the constitutional question whether we can. If you do not have that intention in there the court, in its search of constitutionality, will go down a lot of back paths and byways to try to avoid the Constitution, and you will end up with a lot of litigation, whereas you probably would not with this statement of intention.

Senator HICKENLOOPER. I doubt the question will arise.

Representative PRICE. Under existing law, is it not a fact that the only ownership of the material can be in the Federal Government? So we have already preempted to a degree.

Senator HICKENLOOPER. Let me ask you this: Suppose a plant wants to locate adjacent to a city and the city says there is a radiation hazard and, "We will not tolerate it near this city." The Commission says, "There is no radiation hazard. We will locate the plant next to the city." Do we take away from the city? That is what do here—we take away from the city the right to determine that fact.

Representative PRICE. I do not think we would. You would honor the zoning regulations of any State.

Senator HICKENLOOPER. I am not talking about recognizing or honoring zoning regulations, or convenience, I am talking about legality. We have written too many statutes with shotguns.

Chairman ANDERSON. What confuses me is your statement at the bottom of page 7, Mr. Chairman. You say:

> We believe that the first sentence states explicitly what is substantially implicit in the bill without the sentence.

It seems to me that means you are doing it now and you would like to do it under cover of darkness. I do not know why you do not want to do it in broad daylight. That is all.

My question is: If there is substantial reason for turning off the lights and doing it in the dark, fine, but let us have the reason.

Mr. McCONE. I think the last sentence in the next paragraph explains our position, the sentence reading:

> If the sentence is left out we would be in a better position to make determinations as to the applicability of the law.

This is a matter of legal opinion. If it is the will of this committee to leave it, we do not object.

Chairman ANDERSON. I do not think it is the will of the committee at all that we try to do something you do not want to do. We put this language in after the hearings, on the instructions of the committee, in the feeling that we needed to strengthen the hand of the Commission to deal with these things while we were getting underway, and the Comission might have a chance to go to the States and say, "Let us reach an agreement. We are not going to be harsh about this. We are not going to tell you how to handle an X-ray machine. But when you get down to the radiation hazards which come from byproduct, source, and special nuclear materials, which we own, or largely which we own or have always regulated, then we feel we ought to tell you how best to do it. After that, we are perfectly willing to let you handle it."

That is what we are trying to get to with this sentence.

Senator HICKENLOOPER. I am not sure that is what it says, and I think it could be reached with a very simple statement.

Chairman ANDERSON. I think this is a very helpful discussion, Senator, and I am glad to have it.

Senator HICKENLOOPER. A simple statement that the Federal Government owns the fissionable material and we keep control of it and will not furnish any unless they meet the specifications and regulations the Federal Government wants.

Chairman ANDERSON. What is the ultimate outcome of that?

Say the Northern States Power Co. or somebody builds a plant in South Dakota, and the legislature says, "We are not going to pass a single thing for you. We are going to keep full control. We are going to decide all of these things."

Are we then going to have to say to the Northern States Power people, "We will not furnish any fuels to run the reactor after putting millions of dollars in it"? I do not think so.

After Commonwealth Edison put $45 million in the plant at Dresden, in the State of Illinois, if the State should pass the regulation that they had to have 50 inspectors on the job at all times, all to be appointed politically by one party or the other, no matter which one, Commonwealth might decide to resist that. Would you say, "You will comply with the Illinois law or we will not give you a nickel's worth of material and will not let you have it in your plant and we will confiscate your $45 million"?

That is all we are trying to protect. I do not ordinarily believe in turning over control to the Federal Government, but I believe the Atomic Energy Commission has exercised its authority sensibly and reasonably.

I am attracted to what Senator Hickenlooper says, that maybe we ought to rewrite this language. I do not say it is perfect, but I only want to explain it was put in there to help the Atomic Energy Commission and not to hurt it.

Mr. Van Zandt?

Representative VAN ZANDT. Some months ago, the Price subcommittee held extensive hearings on the subject of employee radiation hazards and workmen's compensation. To properly get into the picture we had to take a look at the laws of the several States. It was my opinion that we, as a committee, through the Commission, encouraged several States to write laws, which they have done, to control the radiation hazards that stem from byproduct, source, and special nuclear materials.

Now, I have a comment here from my State on this particular section, and this is what it says:

It would preclude State action to control radiation hazards until an agreement between the Atomic Energy Commission and the particular State went into effect.

Is that right? That is their interpretation.

It goes on—

Furthermore, it would nullify legislation which is already on the statute books of the several States. The effect would be to create confusion as to the status of existing laws, ordinances, and regulations, and the resulting legal entanglement would hamper an orderly transfer of certain Federal responsibilities to the State.

Listen to this:

If this section is not deleted it should at the very least be amended so as not to take effect until a further date, perhaps 2 years after the passage of the bill, in order that the States may have an opportunity to readjust our current regulations and enter into these agreements with the Atomic Energy Commission.

This is one of the States that already has a law.

Mr. MCCONE. Yes, it is one of several.

Chairman ANDERSON. What State is that?

Representative VAN ZANDT. Pennsylvania. If my memory serves me correctly, I think New York probably has the most effective complex of laws in this field. I think California follows them or may be ahead of them.

Representative PRICE. In the subcommittee hearings you referred to, we put out a committee print which is available to all members, and on page 229 it lists many States that have some type of legislation dealing with this. I think every member of the committee ought to look that list over.

Chairman ANDERSON. In connection with that, may I read from the Cole-Hickenlooper Act, chapter 1, "Declarations, findings, and purpose." Under section 2, "Findings," subsection c and d, it says:

The processing and utilization of source, byproduct, and special nuclear material affect interstate and foreign commerce and must be regulated in the national interest. The processing and utilization of source, byproduct, and special material must be regulated in the national interest and in order to provide for the common defense and security and to protect the health and safety of the public.

If they are affected with interstate commerce, I think probably some States would have a hard time contending the Federal Government had no interest in the field.[1]

[1] For subsequent letter from AEC concerning subsection k, see p. 500.

Go ahead, Mr. Chairman. I know you have some time limitation.

Mr. McCone. The present bill, unlike H.R. 7214 and S. 1987, provides that any proposed agreement, or amendment thereto, with the States must be submitted to the Joint Committee on Atomic Energy and lie before it for 45 days before it may become effective. We prefer not to include such a provision in this bill.

Chairman Anderson. I want to assure the Chairman it is to keep the Joint Committee informed. The fact is there is no criterion in the field and the impression might be left by some people that the Atomic Energy Commission might be whipping the States a little bit. And here in Congress they have spokesmen and representatives.

If the agreements were submitted down here, we might be able to intercede in those cases where, because the Atomic Energy Commission owned the nuclear material, somebody might say they are taking a wrong advantage of the State, or something of that nature, and it is not for the purpose of making it impossible to operate.

Mr. McCone. We feel the criteria in the bill and the provision for hearings, and all that sort of thing, will take care of that.

Chairman Anderson. We grant you this was a new provision written in as a result of discussions of the committee. It is something you had not seen and, therefore, you have a perfect right to comment on it.

Mr. McCone. The provision does not serve a useful purpose, since the bill contains provisions prescribing when the Commission may enter into agreements with the States and what the effect of such agreements will be. We do not propose any executive agreements which do not meet the statutory criteria. Particularly in view of the requirements of publication and opportunity of public participation which are included in the bill, we believe that full provision is made for keeping the Joint Committee informed as to the nature of proposed agreements with the States.

The provision in the bill which provides for the establishment of the Federal Radiation Council is, I am told, objectionable to the Bureau of the Budget. I understand that the Bureau is writing a letter about this which I believe has been sent to the committee and I guess you have received it.

Chairman Anderson. The letter is here. After you have left, if we have time, we will read it to the committee.

(The letter referred to follows:)

Executive Office of the President,
Bureau of the Budget,
Washington, D.C., August 25, 1959.

Hon. Clinton P. Anderson,
Chairman, Joint Committee on Atomic Energy,
U.S. Senate, Washington, D.C.

My Dear Mr. Chairman: On August 21, 1959, I wrote to you informing you of the results of the review, in which this Bureau participated, of Federal organization of radiological health activities.

With that review as background, I believe that I should offer some comments on S. 2568, a bill to amend the Atomic Energy Act of 1954, as amended, with respect to cooperation with States. Specifically, I wish to discuss section 274h which is the chief feature which distinguishes S. 2568 from S. 1987, an administration-sponsored bill. Section 274h would establish in statute a Federal Radiation Council made up of the Surgeon General, the Chairman of the Atomic Energy Commission, the Secretary of Defense, the Secretary of Commerce, the Secretary of Labor, the Chairman of the National Academy of Sciences, the Chairman of the National Committee on Radiation Protection, or their designees, and two members appointed by the President. One such appointed member

would be a qualified expert in the field of biology and medicine and one in the field of health physics, and either could be an employee of a private, State, or local agency concerned with radiation hazards and standards. The special assistant to the President for science and technology, or his designee, would be authorized to attend meetings, participate in the deliberations of, and to advise the Council.

As you know, the long standing position of the executive branch is generally to oppose the establishment by statute of standing committees which are advisory to the President. The reasons for such a position are well and succinctly stated in the report of the first Commission on Organization of the Executive Branch on "General Management of the Executive Branch." We believe those general objections are applicable to the Council provided for in section 274h of S. 2568. The primary function of the Council is to advise the President. We believe that the President should have the utmost flexibility in selecting his immediate advisers. This flexibility would be denied to him in the event that the advisers were to be established by statute.

In addition to our general bases for recommending against statutory arrangements of this kind, there are specific reasons why we believe the creation of a Federal Rediation Council by statute to be both unnecessary and undesirable. On August 14, 1959, the President issued Executive Order 10831 establishing the Federal Radiation Council. The differences between the Federal Radiation Council as established by the President and the Council which would be established by S. 2568 are not insignificant. Section 274h of S. 2568 would not only establish the Council as a statutory body and fix its membership in law, but it would, by broadening the membership to scientists outside the Government, considerably alter the character of the Council. Moreover, section 274h would confer statutory status upon the special assistant to the President for science and technology and upon the National Committee on Radiation Protection, steps which we are not prepared to support at this time.

Radiological health activity is centered around the development, promulgation, and enforcement of operational rules and regulations (standards) for protection against radiation hazards. Practically all operational standards are derived from basic standards for exposure of humans to radiation. Fundamentally, setting basic radiation standards represents the establishment of a theoretical calculated risk. It involves passing judgment on the extent of the possible health hazard which is to be accepted in order to realize the known benefits of radiation. It also involves inevitably a compromise between total health protection (which might require foregoing the use of radiation) and the vigorous promotion of the use of radiation in order to achieve optimum benefits.

Thus, while the establishment of basic standards of exposure is based on available scientific data and analysis, the decisions which must be made are, in their essence, matters of judgment beyond the scope of science. For this reason, the President has designated as his principal advisers in this matter the heads of the agencies who are statutorily responsible to him for carrying out the programs most significantly affected by the decisions made. This arrangement is in contrast to the provisions of S. 2568 wherein scientists with purely scientific responsibilities would be given the same status as public officials with broad statutory program responsibilities to the President.

It is contemplated under the Executive order that the best scientific advice concerning radiation matters will be brought to bear upon the deliberations of the Council. Each member of the Council has available to him in his own agency scientific advice of the highest competence. In addition, the Council is specifically authorized to seek technical advice from any source it deems appropriate. The Council has as one of its first tasks the development of relationships with scientific bodies, such as the National Academy of Sciences and the National Committee on Radiation Protection, to assure that the President receives the advice that he needs from any source without jeopardizing the objectivity or freedom of the scientists involved. Those relationships should be developed over a period of time and caution should be exercised against prematurely establishing an inflexible arrangement such as would be set up under section 274h of S. 2568.

With regard to specific membership of the Council as contemplated in S. 2568, I should like to make the following comments:

> While the capabilities and responsibilities of the Surgeon General are in the field of public health, the nature and composition of the Council makes more appropriate the membership on the Council of the Secretary of Health, Education, and Welfare as the head of the Department of which the Public

Health Service is a part, and who is also the Department head responsible for the administration of the Food, Drug, and Cosmetic Act. Moreover, it would be disruptive to the normal and necessary relationships between the President and the Secretary of Health, Education, and Welfare were a subordinate of the Secretary made responsible by law for providing direct advice to the President.

With regard to the proposed membership of the Secretary of Labor, the responsibilities of that Secretary admittedly are significant. There are, however, Secretaries with other important responsibilities, such as the Secretaries of Agriculture, the Interior, and the Treasury. To give membership to every officer with an interest in radiation would create a Council of a size much too large for effective effort. In this connection, it should be noted that the Secretary of Commerce is a member of the Council by virtue of his statutory responsibilities under 15 U.S.C. 272.

The National Academy of Sciences and the National Committee on Radiation Protection appropriately select their own chairmen. That arrangement would, however, when coupled with the provision of S. 2568, which designates the heads of those organizations as members of the Council, deprive the President of the authority to select those two advisers.

One further point is of significance. Decisions with regard to the basic standards referred to above are considered to be of such importance that responsibility for them cannot appropriately be vested in any officer short of the President. The views and advice of the Council which would be established by S. 2568 would, because of the Council's statutory origin, come to be identified by the public as independent and separable from those of the President. An organization constituted for the purpose of advising the President should be established under an arrangement which would require it to report only to the President if it is properly and fully to perform its assigned role. This is assured under the arrangement whereby the Council is established by Executive order.

During the review which, among other things, led to the issuance of Executive Order 10831 the most careful consideration was given to whether the Federal Radiation Council should be established by statute. For the reasons outlined above, the conclusion was reached that the duties of the Council would be such as to make statutory status not only undesirable but seriously inappropriate. Accordingly, the Bureau of the Budget strongly recommends the enactment of S. 2568 without any provisions along the lines of section 274h.

We also question the desirability of section 274e(2), which requires that proposed agreements between the Commission and the Governor of a State dealing with radiation health and safety regulation under this bill be submitted to the Joint Committee on Atomic Energy for 45 days prior to taking effect. We recognize the desire of the Congress to keep itself informed as to matters affecting legislation. We believe, however, that adequate arrangements for providing such information already exist without additional resort to a statutory 45-day waiting period. We therefore beli ye that the section is unnecessary.

Sincerely yours,

MAURICE H. STANS, *Director.*

Mr. McCONE. My view is that the Council should not be provided for in the law. The basic decisions on radiation are, in the final analysis, the responsibility of the President, who should be authorized to seek advice or counsel from persons of his own choice. This has already been done through the establishment by Executive order of the Federal Radiation Council, the composition of which may need to be changed as circumstances change. In establishing such a Council the President should have the heads of agencies as members.

We have a few minor drafting changes in the bill to suggest. If agreeable to the committee, I will ask the Commission staff to give them to the committee staff.

Chairman ANDERSON. Could I stop here and point out there are organizations, like the Space Advisory Council and others, that have been set up that are open to the same objections. Did the President object to those when the bills were under consideration?

Mr. McCONE. I do not believe so.

Chairman ANDERSON. I think I heard the testimony, and he did not object.

Mr. MCCONE. I do not think he objected to the Space Council nor do I think he has ever objected to the National Security Council, which likewise is set up by law.

Chairman ANDERSON. The National Security Council?

Mr. MCCONE. Is set up by the National Security Act of 1947.

Chairman ANDERSON. Yes. You recognize that the Federal Radiation Council as now constituted carefully omits any representation from the public, as such, and involves only the President's Cabinet and people who are appointed by the President, and it leaves no opportunity for any outside point of view. That is what the National Security Council tried to get away from, as does the Space Council, and various other groups.

(The letter referred to on pp. 489 and 496 follows:)

U.S. ATOMIC ENERGY COMMISSION,
August 26, 1959.

Hon. CLINTON P. ANDERSON
Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR SENATOR ANDERSON: At the hearings held by the Joint Committee on Atomic Energy this morning on S. 2568 and H.R. 8755, there was testimony by the Commission and general discussion concerning the first sentence of subsection k. This sentence provides that:

"k. It is the intention of this Act that State laws and regulations concerning the control of radiation hazards from byproduct, source, and special nuclear materials shall not be applicable except pursuant to an agreement entered into with the Commission pursuant to subsection b.: *Provided, however*, That States may adopt registration requirements for such materials and may inspect the use of such materials within the State to assure compliance with the Commission's regulations."

At the hearing, we recommended the omission of the sentence. In making this recommendation, we did not intend to change the substantive effect of the bill because we believe that under this bill, with or without the sentence, the Federal Government will clearly have "preempted" the regulation and control of radiation hazards from source, byproduct, and special nuclear materials. In either event, preemption will end in any State only upon the effective date of an agreement between the State and the Commission under subsection b. and only to the extent provided in the agreement.

In suggesting the elimination of the sentence, we did not intend to leave any room for the exercise of concurrent jurisdiction by the States to control radiation hazards from those materials. Our sole purpose was to leave room for the courts to determine the applicability of particular State laws and regulations dealing with matters on the fringe of the preempted area in the light of all the provisions and purposes of the Atomic Energy Act, rather than in the light of a single sentence.

For example, in the absence of the sentence, the courts might have greater latitude in sustaining certain types of zoning requirements which have purposes other than control of radiation hazards, even though such requirements might have an incidental effect upon the use of source, byproduct, and special nuclear materials licenses by the Commission.

Sincerely yours,

A. R. LUEDECKE,
General Manager.

(Subsequently, Senator Anderson received the following letter dated August 28, 1959, from Arthur S. Flemming, Secretary of the Department of Health, Education, and Welfare:)

THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE,
Washington, August 28, 1959.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
U.S. Senate.

DEAR SENATOR ANDERSON: As Chairman of the Federal Radiation Council established by the President on August 14, 1959, under Executive Order 10831, I wish on behalf of the Council to express our strong opposition to those provisions of S. 2568 as ordered reported out by your committee which would by statute require the President to appoint to the Council members other than those provided for in the Executive order.

As section 274(h) of S. 2568 itself implicitly recognizes, the decisions with respect to which the Council would advise the President are decisions of such importance that only he should assume responsibility for making them. Since he alone is responsible for these decisions, he should be free to decide from whom he wishes to obtain advice in reaching them.

The bill as reported out would seriously impair this freedom. It would require the President to accept as members of the Council individuals representing outside agencies over whose selection he would have no control. In addition, it would require him to appoint to the Council other outside members not responsible to him for the conduct of their own activities. While the President may well wish to avail himself of advice from just these sources, it should not be made mandatory that he do so.

Insofar as the provisions of S. 2568 establishing a statutory Advisory Council reflect a concern that the President should have made available to him top-level scientific advice, I can emphatically assure your committee that the Council will see to it that advantage is taken of the most competent sources of such advice both within and without the Government. It is, indeed, for this reason that the Executive order specifically provides for advice to the Council by the Special Assistant to the President for Science and Technology. It is important at the same time to emphasize the point made by the Director of the Bureau of the Budget in his letter to you of August 25, 1959, that relationships with scientific bodies such as the National Academy of Science and the National Committee on Radiation Protection should be developed over a period of time and caution should be exercised against prematurely establishing an inflexible arrangement with any specifically designated bodies.

I earnestly hope that the committee will reconsider its action in respect to the composition of the Advisory Council provided for under section 274(h) in the light of the considerations set forth above.

Sincerely yours,

ARTHUR S. FLEMMING, *Secretary.*

(Thereafter, on August 31, 1959, the Joint Committee met to consider the bills further, and voted to report out the bills, S. 2568 and H.R. 8755, with amendments, as indicated below (deleted matter shown in brackets and new matter shown in italic):)

[S. 2568, 86th Cong., 1st sess., as reported out by Joint Committee on Atomic Energy, with amendments]

A BILL To amend the Atomic Energy Act of 1954, as amended, with respect to cooperation with States

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following section be added to the Atomic Energy Act of 1954, as amended:

"SEC. 274. COOPERATION WITH STATES.—

"a. It is the purpose of this section—

"(1) to recognize the interests of the States in the peaceful uses of atomic energy, and to clarify the respective responsibiilties under this Act of the States and the Commission with respect to the regulation of byproduct, source, and special nuclear materials;

"(2) to recognize the need, and establish programs for, cooperation between the States and the Commission with respect to control of radiation hazards associated with use of such materials;

"(3) to promote an orderly regulatory pattern between the Commission and State governments with respect to nuclear development and use and regulation of byproduct, source, and special nuclear materials;

"(4) to establish procedures and criteria for discontinuance of certain of the Commission's regulatory responsibilities with respect to byproduct, source, and special nuclear materials, and the assumption thereof by the States;

"(5) to provide for coordination of the development of radiation standards for the guidance of Federal agencies and cooperation with the States; and

"(6) to recognize that, as the States improve their capabilities to regulate effectively such materials, additional legislation may be desirable.

"b. Except as provided in subsection c., the Commission is authorized to enter into agreements with the Governor of any State providing for discontinuance of the regulatory authority of the Commission under chapters 6, 7, and 8, and section 161 of this Act, with respect to any one or more of the following materials within the State—

"(1) byproduct materials;

"(2) source materials;

"(3) special nuclear materials in quantities not sufficient to form a critical mass.

During the duration of such an agreement it is recognized that the State shall have authority to regulate [and license] the materials covered by the agreement for the protection of the public health and safety from radiation hazards.

"c. No agreement entered into pursuant to subsection b. shall provide for discontinuance of any authority and the Commission shall retain authority and responsibility with respect to regulation of—

"(1) the construction and operation of any production or utilization facility;

"(2) the export from or import into the United States of byproduct, source, or special nuclear material, or of any production [of] *or* utilization facility;

"(3) the disposal into the ocean or sea of byproduct, source, or special nuclear waste materials as defined in regulations or orders of the Commission;

"(4) the disposal of such other byproduct, source, or special nuclear material as the Commission determines by regulation or ordered should, because of the hazards or potential hazards thereof, not be so disposed of without a license from the Commission. Notwithstanding any agreement between the Commission and any State pursuant to subsection b., the Commission is authorized by rule, regulation, or order to require that the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing source, byproduct, or special nuclear material shall not transfer possession or control of such product except pursuant to a license issued by the Commission.

"d. The Commission shall enter into an agreement under subsection b. of this section with any State if—

"(1) the Governor of that State certifies that the State has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by the proposed agreement, and that the State desires to assume regulatory responsibility for such materials; and

"(2) the Commission finds that the State program is compatible with the Commission's program for the regulation of such materials, and that the State program is adequate to protect the public health and safety with respect to the materials covered by the proposed agreement.

"e. (1) Before any agreement under subsection b. is signed by the Commission, the terms of the proposed agreement and of proposed exemptions pursuant to subsection f. shall be published once each week for [three] *four* consecutive weeks in the Federal Register; and such opportunity for comment by interested persons on the proposed agreement and exemptions shall be allowed as the Commission determines by regulation or order to be appropriate.

["(2) Before the Commission enters into any proposed agreement or amendment thereto under subsection b., the proposed agreement or amendment shall be submitted to the Joint Committee, and a period of forty-five days shall elapse while Congress is in session (in computing such forty-five days, there shall be excluded the days on which either House is not in session because of adjournment for more than three days): *Provided, however,* That the Joint Committee after having received the proposed agreement or amendment may

by resolution in writing waive the conditions of or all or any portion of such forty-five day period.]

"[(3)](2) Each proposed agreement shall include the proposed effective date of such proposed agreement or exemptions. The agreement and exemptions shall be published in the Federal Register within thirty days after signature by the Commission and the Governor.

"f. The Commission is authorized and directed, by regulation or order, to grant such exemptions from the licensing requirements contained in chapters 6, 7, and 8, and from its regulations applicable to licensees as the Commission finds necessary or appropriate to carry out any agreement entered into pursuant to subsection b. of this section.

"g. The Commission is authorized and directed to cooperate with the States in the formulation of standards for protection against hazards of radiation to assure that State and Commission programs for protection against hazards of radiation will be coordinated and compatible.

"h. [There is hereby established a Federal Radiation Council, consisting of the Surgeon General, the Chairman of the Atomic Energy Commission, the Secretary of Defense, the Secretary of Commerce, the Secretary of Labor, the Chairman of the National Academy of Sciences, the Chairman of the National Committee on Radiation Protection, or their designees, and two members appointed by the President. One such appointed member shall be a qualified expert in the field of biology and medicine and one in the field of health physics, and either may be an employee of a private, State, or local agency concerned with radiation hazards and standards.] *There is hereby established a Federal Radiation Council, consisting of the Secretary of Health, Education and Welfare, the Chairman of the Atomic Energy Commission, the Secretary of Defense, the Secretary of Commerce, the Secretary of Labor, or their designees, and such other members as shall be appointed by the President. The Council shall consult qualified scientists and experts in radiation matters, including the President of the National Academy of Sciences, the Chairman of the National Committee on Radiation Protection and Measurement, and qualified experts in the field of biology and medicine and in the field of health physics.* The Special Assistant to the President for Science and Technology, or his designee, is authorized to attend meetings, participate in the deliberations of, and to advise the Council. The Chairman of the Council shall be designated by the President, from time to time, from among the members of the Council. The Council shall advise the President with respect to radiation matters, directly or indirectly affecting health, including guidance for all Federal agencies in the formulation of radiation standards and in the establishment and execution of programs of cooperation with States. The Council shall also perform such other functions as the President may assign to it by Executive order.

"i. The Commission in carrying out its licensing and regulatory responsibilities under this Act is authorized to enter into agreements with any State, or group of States, to perform inspections or other functions on a cooperative basis as the Commission deems appropriate. The Commission is also authorized to provide training, with or without charge, to employees of, and such other assistance to, any State or political subdivision thereof or group of States as the Commission deems appropriate. Any such provision or assistance by the Commission shall take into account the additional expenses that may be incurred by a State as a consequence of the State's entering into an agreement with the Commission pursuant to subsection b.

"j. The Commission, upon its own initiative after reasonable notice and opportunity for hearing to the State with which an agreement under subsection b. has become effective, or upon request of the Governor of such State, may terminate or suspend its agreement with the State and reassert the licensing and regulatory authority vested in it under this Act, if the Commission finds that such termination or suspension is required to protect the public health and safety.

"k. [It is the intention of this Act that State laws and regulations concerning the control of radiation hazards from byproduct, source, and special nuclear materials shall not be applicable except pursuant to an agreement entered into with the Commission pursuant to subsection b.: *Provided, however,* That States may adopt registration requirements for such materials and may inspect the use of such materials within the State to assure compliance with the Commission's regulations.] Nothing in this section shall be construed to affect the authority of any State or local agency to regulate activities for purposes other than protection against radiation hazards.

"l. With respect to each application for Commission license authorizing an activity as to which the Commission's authority is continued pursuant to subsection c., the Commission shall give prompt notice to the State or States in which the activity will be conducted of the filing of the license application; and shall afford reasonable opportunity for State representatives to offer evidence, interrogate witnesses, and advise the Commission as to the application without requiring such representatives to take a position for or against the granting of the application.

"m. No agreement entered into under subsection b., and no exemption granted pursuant to subsection f., shall affect the authority of the Commission under subsection 161 b. or i. to issue rules, regulations, or orders to protect the common defense and security, to protect restricted data or to guard against the loss or diversion of special nuclear material. For purposes of subsection 161i., activities covered by exemptions granted pursuant to subsection f. shall be deemed to constitute activities authorized pursuant to this Act; and special nucelar material acquired by any person pursuant to such an exemption shall be deemed to have been acquired pursuant to section 53.

"n. As used in this section, the term 'State' means any State, Territory, or possession of the United States, the Canal Zone, Puerto Rico, and the District of Columbia."

SEC. 2. Section 108 of the Atomic Energy Act of 1954, is amended by deleting the phrase "distributed under the provisions of subsection 53a.," from the second sentence.

(Whereupon, the committee proceeded to further business in executive session.)

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